Saga of a Surgeon

The Life of Daniel Brainard, M.D.

Janet Kinney

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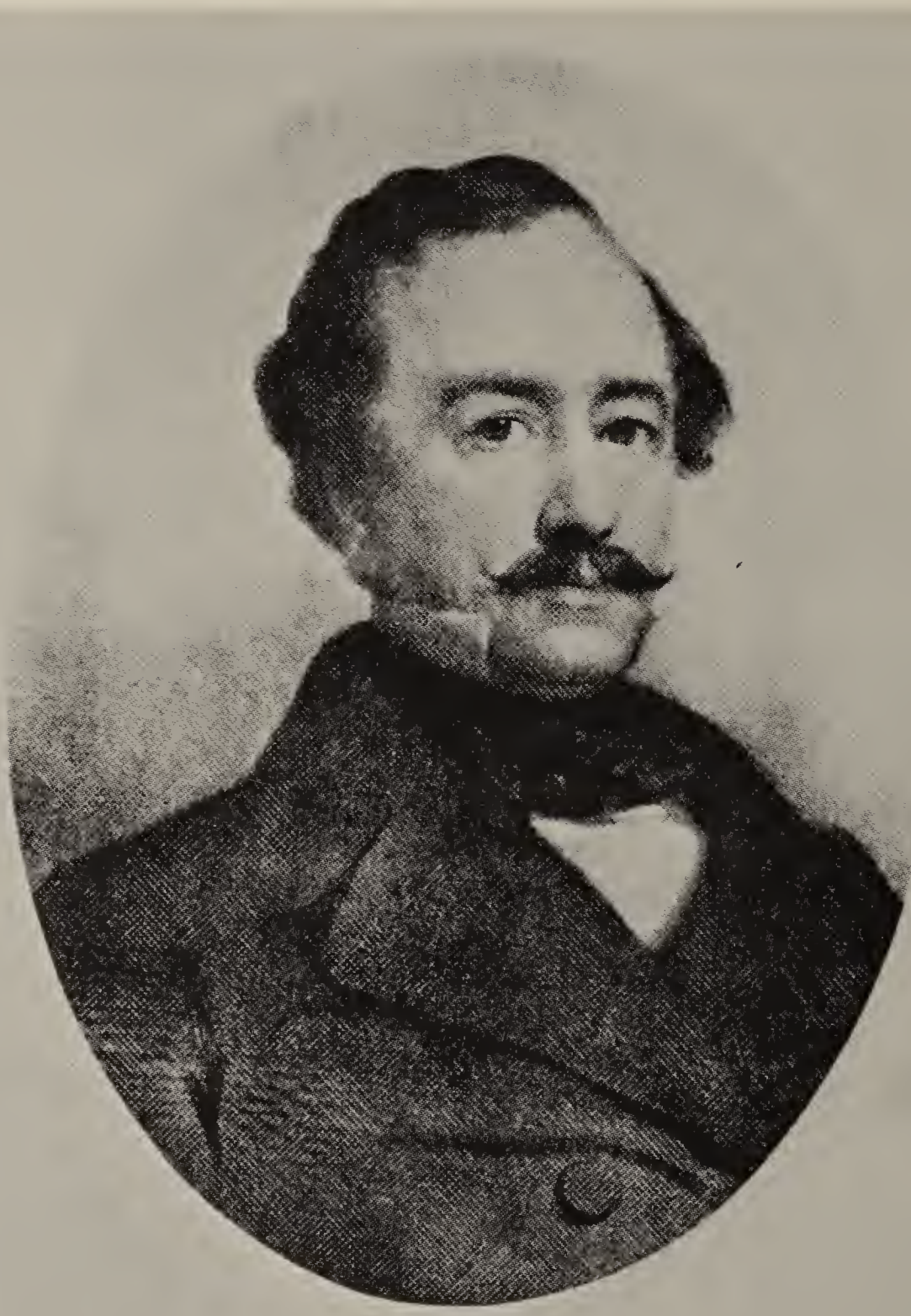

Daniel Brainard

Saga of a Surgeon: The Life of Daniel Brainard, M.D.

With Bibliography and Selected Papers

To Sheldon Gordon
from Janet Kinney

by Janet Kinney, M.D.

Southern Illinois University
School of Medicine

Medical Humanities Series

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Published by Southern Illinois University School of Medicine,
Department of Medical Humanities
Printed in the United States of America.
Production design by Omnigraphics
Typesetting by Patricia Baker
Production supervised by Helen Tuck
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Library of Congress Cataloguing in Publication Data:

Main entry under title:
Saga of a surgeon.
(Medical Humanities series)
Includes bibliographical references and index.

LC # 87-62176
ISBN: 0-931369-20-7

Saga of a Surgeon:
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Contents

Illustrations viii

Acknowledgments xi

The Promise of Spring
I. Youth and Training 1
II. Hanging up a Shingle 23
III. Paris Interlude 33

The Growth of Summer
IV. The Founding of Rush Medical College 41
V. Growing Pains and Pleasures 59
VI. A Changing World 69
VII. Paris Revisited 89

The Bitterness of Autumn
VIII. Academic Civil War at Rush 105
IX. National Civil War 117

The Resignation of Winter
X. Journey's End 135

Appendix A 157
Sources 157

Appendix B 161
Major Scientific Papers 161

Appendix C 173
Selected Papers 173
Amputation at the Hip Joint 175
Essay on a New Method of Treating Serpent Bite and Other Poisoned Wounds 183
Address to the Graduating Class of 1848-49 201
Specialties and Specialists in Medicine 215

Author 227

Index 229

Illustrations

	Daniel Brainard (Frontispiece)	
Fig. 1	*Dearborn Street Drawbridge*	*xii*
Fig. 2	*Chicago in 1831*	*5*
Fig. 3	*Fairfield Medical Schoól, Laboratory Building*	*9*
Fig. 4	*Fairfield Medical School, South Building*	*12*
Fig. 5	*Jefferson Medical School, Philadelphia*	*17*
Fig. 6	*Edmund Stoughton Kimberly*	*26*
Fig. 7	*Josiah Cosmore Goodhue*	*29*
Fig. 8	*Dr. Brainard's Office*	*42*
Fig. 9	*View of Chicago from the Prairie, 1845*	*46*
Fig. 10	*Annual Announcement of Rush Medical College, 1843-4*	*49*
Fig. 11	*Stock Certificate of Rush Medical College*	*51*
Fig. 12	*John M. Van Osdel*	*53*
Fig. 13	*Faculty of Rush Medical School, 1844-5*	*60*
Fig. 14	*Cover of the* Illinois Medical and Surgical Journal	*63*
Fig. 15	*Student Class Tickets*	*70*

Fig. 16	*Rush Medical College*	*76*
Fig. 17	*John Evans*	*81*
Fig. 18	*Nathan Smith Davis*	*84*
Fig. 19	*Rush Medical College, 1855*	*103*
Fig. 20	*J. Adams Allen*	*109*
Fig. 21	*DeLaskie Miller*	*111*
Fig. 22	*Robert Laughlin Rea*	*112*
Fig. 23	*Joseph Warren Freer*	*121*
Fig. 24	*Ephraim Ingals*	*122*
Fig. 25	*Edward Lorenzo Holmes*	*127*
Fig. 26	*Map of Fort Donelson*	*131*
Fig. 27	*Nathan Smith Davis*	*138*
Fig. 28	*John Evans*	*144*
Fig. 29	*Daniel Brainard*	*156*
Fig. 30	*Surgical Kit*	*180*

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(Frontispiece photo of Daniel Brainard courtesy of Rush-Presbyterian-St. Luke's Medical Center Archives.)

Acknowledgments

I would not have attempted writing this book without the encouragement of Stanton A. Friedberg, M.D., Ruth Grodzins, and Doris Bolef, Librarian, Rush-Presbyterian-St. Luke's Medical Center. I am grateful to the Sara C. and Harold Lincoln Thompson Fund of the California Community Foundation for their generous support. Without the assistance, loyal support, and vast forbearance of Helen Yast, the book would not have been completed.

I am deeply indebted and very grateful to the Medical Humanities Series editorial staff, especially to Glen W. Davidson, Ph.D., editor, Linda Keldermans, associate editor, and Lynne Cleverdon, business manager. To have Thomas Bonner, Ph.D., and Emmet F. Pearson, M.D. do the external review and critique was an honor. I know that typesetter Pat Baker and all the members of the staff of the Southern Illinois University School of Medicine's Word Processing Center wear halos.

The aid and advice of William Kona, archivist, Rush Medical Center, and William K. Beatty, archivist, Northwestern University Medical School, were valued and appreciated. The library, archives, and photographic departments of the Chicago Historical Society were very helpful. I would like to thank Dr. Robert J. T. Joy and Dr. William S. Dudley for advice on military medicine.

To Mary Kosinski—who deciphered my writing with clairvoyance, and to the members of the Rush Medical Photography Department and the Quick Copy Center who worked with such enthusiasm—my gratitude is due.

Fig. 1. Dearborn Street drawbridge, built in 1834. (Engraving from History of Chicago, *by A.T. Andreas, vol. I, 1884, page 631. Photo courtesy of Chicago Historical Society.)*

Chapter I
Youth and Training

On a hot afternoon in the fall of September, 1836, a tired dusty young man on a tired dusty old pony rode into Chicago. His name was Daniel Brainard and like so many other young men of the time, he was seeking fame and fortune.[1]

The street meandered before him, lost in a cloud of dust. From it rose high wooden sidewalks that in the winter skirted the deep mud. Fronting the sidewalk were an inn, several taverns, a drug store, the boat company office, and the dry goods store. Looking north he could see the river and the little drawbridge that connected the two sides of the settlement.

In 1833 the town with a population of 350 had been incorporated. Now it had increased tenfold to 3,500, which accounted for its unique atmosphere of combined straggling and bustling. Forgotten were the troubles of the Black Hawk War, and the terror of the cholera epidemic brought by the troops who had come to defend the settlers from the Indians. Instead there reigned the frenzy and excitement of a land boom, generated by the sale of Indian land and the prospect of the Illinois-Michigan Canal.

Daniel Brainard, the newcomer, was born in Western, a town in Oneida County, New York, on May 15, 1812, a month before the outbreak of the War of 1812. The first Daniel Brainard had come as a child from England to Hartford, Connecticut, at an unknown date. By 1662 as a grown man he had settled in Haddam, Connecticut. A number of generations later, Jepthai

Brainard was born on November 4, 1774, and married Catherine Comstock on August 14, 1802. The newlyweds moved to a farm in northwestern New York where their nine children were born, the fifth child and second son being Daniel.[2] He and his older brother Edwin did the farm chores but had time for playing with puppies and ponies, for riding and skating, and for hunting and fishing. As their children grew up, Jepthai and Catherine were determined that the boys should have the best possible education. Daniel and his brother went to the local school and then to the academy at Oneida Institute in nearby Whitesboro, where they received a firm grounding in reading, writing and arithmetic. They were also instructed in geography, algebra and Latin. There was usually a drawing master at the academy and Daniel may have had lessons in sketching.

After graduation came the momentous decision of what career to follow. Since the oldest son would be expected to carry on the family farm, Daniel was free to make his own decision subject to his family's approval. At age sixteen he knew he wanted to be a doctor. His family was pleased with his choice, and wanted him to get the best training they could afford.

In the first half of the nineteenth century this training began with an apprenticeship to a practicing physician, usually for a period of three years. The yearly fee was around a hundred dollars. When the apprenticeship was completed, four out of five young men went into practice, and only one went on to medical school. All these young men were far outnumbered by those who hung out a shingle with no hint of training.

Arranging an apprenticeship was a difficult procedure for a family—first, in making sure that a boy of fifteen or sixteen really knew that he was making the right career choice; second, in selecting the physician to whom he would be apprenticed; and third, in financing the arrangement.

Daniel Drake (1785-1852), a famous physician and founder of medical schools, noted that many families selected medicine if the boy was "thought too weakly to labor on the farm or in the workshop; . . . indolent and averse to bodily exertion; or addicted to study, but too stupid for the Bar or too immoral for the Pulpit."[3] Drake had even more reservations about the physicians who took apprentices and he advised parents to evaluate talent, learning and conscientiousness and moral and

chaste habits, noting that "intemperance, in the United States at least, has been regarded as a prevailing vice of the profession."[4]

Brainard was apprenticed to the family's physician, R. S. Sykes of Whitesboro, a capable, thorough and conscientious man with a large practice. From the family's standpoint it was a good choice because it was close enough to home for a sixteen-year old. The following year he was sent to Dr. Harold H. Pope of Rome, New York, for his last two years, probably at the suggestion of Dr. Sykes, who felt he would see a wider variety of cases in the larger town.

An apprenticeship was a busy life—a twenty-four-hour a day one—shared with the doctor and his family. The apprentice kept the office clean, took care of the horse, prepared powders and ointments, did dressings and bandaging. He saw patients with the doctor in his office and on house calls, and read whatever medical books were available in the doctor's library. Apprenticeships varied widely in value, depending on the ability of the physician to practice and to teach, and of the apprentice to work and to learn.

Benjamin Rush (1745-1813), for example, reflecting on his apprenticeship with James Redman (1733-1828), the leading physician of his time in Philadelphia, wrote:

> In the month of February 1761 I began the study of medicine and continued constantly in my master's family and shop 'till July 1766. During this period I was absent from his business but eleven days, and never spent more than three evenings out of his house. My master at this time was in the most extensive business of any physician in the city, and as he had at no time more than two apprentices, he kept them constantly employed. In addition to preparing and compounding medicine, visiting the sick and performing many little offices of a nurse to them, I took the exclusive charge of his books and accounts. It may not be amiss to mention here that before I began the study of medicine, I had an uncommon aversion from seeing such sights as are connected with its practice. But a little time and habit soon wore away all that degree of sensibility

> which is painful, and enabled me to see and even assist with composure in performing the most severe operations in surgery.... I read in the intervals of my business and at late and early hours, all the books on medicine that were put into my hands by my master, or that I could borrow from other students of medicine in the city.[5]

In contrast, Samuel Gross (1805-1884), a contemporary of Daniel Brainard, had experienced a very disillusioning apprenticeship. Gross later described his apprenticeship in these words:

> I was nineteen years of age when I commenced in earnest the study of medicine. My preceptor was Dr. Joseph K. Swift, of Easton, a graduate of the University of Pennsylvania, and a practitioner of some note, with considerable pretension to scientific knowledge, and a deadly hatred of quackery. The understanding was that I was to remain under his tuition for three years, inclusive of two lecture terms, and that he was to receive, as an office fee, two hundred dollars, for which he was to furnish me with the use of certain books, and to examine me once a week on such branches as I might be studying. His library was small, and its contents of little value. He had no apparatus of any kind, plates or diagrams, no specimens in *materia medica*, or anatomical preparations; nothing, in short, but a skeleton, and this, with the aid of Wistar's Anatomy, was the first thing I set out to master.... From anatomy I went to surgery, then to *materia medica*, and finally to midwifery and the practice of medicine ... it was a waste of precious time ... and fell far short of what a student had a right to expect from his preceptor. Perhaps, however, this was not his fault, but the fault of the vicious system of office pupilage, still prevalent in nearly all sections of this country, a system which cannot be too pointedly condemned.[6]

In Daniel Brainard's three years of apprenticeship, he was introduced to the practice of medicine by two able family

Fig. 2. Chicago in 1831. (Lithograph, "Chicago in 1831," by Rufus Blanchard—in 1876-1877. Photo courtesy of Chicago Historical Society.)

doctors. In their offices and in the homes of their patients he saw babies with diarrhoea, children with fever, men with fractures and lacerations, women in childbirth, grandparents with stiff joints and brittle bones. He learned the rudiments of the meager treatment that could be offered. He also learned the value of common sense, hope and courage.

Meanwhile he discussed medical schools with his preceptors and the local physicians, and other apprentices and medical students. There were established schools in Philadelphia, New York and Boston. Since the Revolutionary War the "country" schools had also become prevalent. These schools were like Henry Wadsworth Longfellow's little girl with the curl in the middle of her forehead—"when they were good they were very very good and when they were bad they were horrid."[7]

Nearby was a shining example of a good school—Fairfield Medical College. Known more formally as the College of Physicians and Surgeons of the Western District of the State of New York, and sometimes as Herkimer County Medical School, the school was started in 1809 and chartered in 1812. Dr. Manley, in his 1827 presidential address to the New York Medical Society, noted: "It appears to have been established by the Regents with a single eye to the improvement of the character of the profession in the interior and more remote parts of the State."[8]

Fortunately, the "single eye" of the regents fixed on Lyman Spalding (1775-1821), who was practicing in Portsmouth, New Hampshire, and who embodied the qualifications they had in mind. Spalding was born in Cornish, New Hampshire. When he was only eleven the family doctor, Nathan Smith, realizing that the boy was unusually bright and studious, had arranged to have him educated at Charleston Academy and then at Harvard Medical School, where he graduated in 1797. Immediately after graduation Dr. Smith brought Spalding to Dartmouth as chemical lecturer and demonstrator at the medical school which he was starting.

When Spalding came to Fairfield, he taught anatomy and surgery, chemistry and *materia medica*, and obstetrics while he was gathering a faculty. Of all the qualifications that he brought to the school, perhaps the greatest was his gift for friendship. He was loved by his friends and colleagues, and by his patients and students, and was truly mourned when in 1821

he died at the age of forty-six.[9]

Westel Willoughby succeeded Spalding, serving as president until the school closed in 1840. Fairfield Medical College was at its peak in growth, size and influence when Brainard applied for entrance. At a time when many schools were lowering admission standards, this one set its admissions higher:

> Every person who shall not have received a collegiate education, shall previously to his examination give satisfactory evidence to the President, Vice-President, and Professors, that he has an acquaintance with the Latin language, that he possesses a correct knowledge of English grammar, natural and experimental philosophy, and that he sustains a fair moral character.[10]

In spite of its excellent faculty and high standards, Fairfield's country location was a disadvantage. In its circular of 1839 the college rose to its own defense:

> The College is within 8 miles of the Great Rail-Road from Albany to Utica; and any Medical Student, who is deterred from coming to the Institution by the dread of riding over 8 miles of a country road, had better choose some other profession than that of Medicine. It is true, that the village has only one tavern, and no theatre, except the anatomical, and not a single grocery licensed to sell ardent spirits, but it has three churches, a moral population, and good boarding-houses. It is to be hoped that parents will think these advantages sufficient to counterbalance the want of incentives to idleness and dissipation.[11]

This argument convinced Jepthai and Catherine Brainard. Dr. Sykes and Dr. Pope considered Fairfield an excellent school. Daniel was persuaded by a youthful emotion—hero-worship. The professor of surgery at Fairfield was John Delamater (1787-1867), a fine surgeon and an excellent teacher—young and brilliant, dashing and exciting. And that was the type of physician that Daniel Brainard wanted to be.

Daniel applied and was accepted at Fairfield. In the autumn of 1831 he arrived, one among 205 students. They boarded at rooming houses in town for eight to twelve shillings per month and walked to the school which was on the edge of town. All was peaceful while the two hundred students crammed the benches of the lecture halls, but it became a very different scene when they spilled out into the surrounding fields to run and wrestle and play ball.

The school had adequate lecture halls, an "obstetrical machine," chemical works and mineralogical specimens. It also had an anatomical theatre, a museum, and dissecting rooms, but finding bodies presented a problem. On January 19, 1819, the trustees ordered dismissal for any student concerned directly or indirectly with the digging up of any human bodies for the purpose of dissecting in the college. For a year the trustees pondered the problem. Then on January 20, 1820, they petitioned the legislature for a law giving the unclaimed bodies of convicts at the Auburn State Prison to the school for dissection purposes. Their petition was granted.[12]

The strength of the school was not in buildings but in the men who taught there. James McNaughton (1796-1874) held the chair of anatomy and physiology. Anatomy in this period was often taught by Scotsmen educated in Edinburgh or Glasgow, so generations of medical students learned Latin anatomical names with a Scottish burr. McNaughton was born in Kenmore, Scotland, and entered Edinburgh University at sixteen. Four years later he graduated with an M.D., and quickly took a ship's surgeoncy. Landing at Quebec, he made his way to Albany where he settled and practiced for the rest of his life. He was a practical and kindly teacher who struggled to see that each student knew and understood anatomy.[13]

James Hadley (1785-1869) was the professor of chemistry, which was being introduced into the medical curriculum in this period. Its importance was realized by Lyman Spalding and Westel Willoughby. At this time, however, the chemistry taught bore little resemblance to the physiological chemistry of today and dealt in a large part with mineralogy. Through this introduction a number of early American physicians developed an interest in and added to the knowledge of geology in America.[14]

John Stearns (1770-1848) lectured on the theory and practice

Fig. 3. Fairfield Medical School laboratory building, erected in 1809. (From George H. Weaver, "Beginnings of Medical Education in and near Chicago" in Bulletin of the Society of Medical History of Chicago, *vol. 3, no. 4, page 341, September, 1925.)*

of medicine. He had been educated in Philadelphia and had practiced in Albany, N.Y., before moving to New York City. In 1907 Stearns published an article on the use of ergot in labor, and all his life he continued to contribute to medical journals. He impressed on his students the importance of scientific clinical observation, and of contributing to that body of knowledge. He was the first president of the New York Academy of Medicine.[15]

The chair of jurisprudence was filled to overflowing by the 275 pounds of Theodric Romeyn Beck (1791-1855). Born in Schenectady, New York, Beck was educated at the New York College of Physicians, received his degree in 1811, and moved to Albany to practice. However, because of his great empathy with the sick, he found that writing was less draining than working with patients, and at the end of six years he gave up his practice entirely. His most celebrated book, *Elements of Medical Jurisprudence*, became an authoritative medico-legal text not only in the United States but in Great Britain and Germany as well. He delighted when at work in surrounding himself with great piles of books whether he happened to need them or not, "merely from the joy of having his darlings stacked about him."[16]

Westel Willoughby, the president of the medical school, taught obstetrics except when he was in the legislature giving birth to laws.[17]

John Delamater was head of surgery and the favorite of all the students. He resembled the professors of the Middle Ages, who had taught everywhere and everything. Over a period of forty years Delamater taught in nine schools. He was always prepared for his lectures, always punctual, and always with time for any bewildered student. Daniel, as well as many thousands of other students, found a worthy object for his hero-worship in Delamater.[18]

In the thirty-one years of its existence Fairfield had 3,123 students and 549 graduates. Many of these men went west to the frontier areas of Illinois, Indiana and Michigan, and some even to the Pacific coast. They not only cared for their patients; they started schools to teach physicians to care for future patients.

Fairfield was exceptional. The more common picture of country schools may be seen in the thesis of one Andrew

Boardman, who attended Geneva College, New York from 1839 to 1840. In his thesis Boardman compared the promises of the school circular with their fulfillment and found numerous shortcomings—such as no bodies for dissection and only a single one for demonstration. The last promise of the circular was that the students should have the great advantage of clinical instruction at the Western Hospital. Boardman described the fulfillment of this promise:

> The Western Hospital consisted of the second floor of an old building labeled in large letters, "Geneva Shoe Store," and during the whole session it contained not *one* medical patient and *only one* surgical patient. I was the house surgeon and performed my daily rounds for a considerable time by going from one side of the bed of a quiet old negress to the other.[19]

In 1832, after a year at Fairfield, Brainard went to Jefferson Medical School in Philadelphia to widen his horizons. Philadelphia had hospitals, clinics, museums and two good medical schools. The University of Pennsylvania Medical School, founded in 1765, was the first medical school in the United States. Although it had been forced to close its doors during the Revolutionary War and had been riven by faculty quarrels throughout most of its existence, it was now firmly established as the most prestigious medical school in the country. On the other hand, Jefferson Medical School, founded in 1825 by George McClellan, had gone through a stormy period of six years under different colleges, boards and trustees with a good but rapidly changing faculty. The deciding factor for Daniel was again the professor of surgery, the brilliant George McClellan.

Philadelphia, as the largest city in the new republic, was exciting to a young man from the country. A future colleague of Brainard's, John Evans, a Quaker boy from the town of Waynesville, Ohio, describes his initial visits to Philadelphia in a letter to his cousin:

> . . . in the evening went to Chestnut Street theatre—the best on the Continent—had a first-rate

Fig. 4. Fairfield Medical School south building, erected in 1825. (From George H. Weaver, "Beginnings of Medical Education in and near Chicago" in Bulletin of the Society of Medical History of Chicago, *vol. 3, no. 4, page 343, September, 1925.)*

> play. Here I enjoyed myself. Next evening we were again found sitting listening with rapture at the pure eloquence of the stage. O, that I could be at the theatre until I was tired of it. Hast thou ever seen a theatrical performance? If not, go as soon as thee can. . . .[20]

And in another letter a month later:

> Yesterday, early, Noah and I started off to the City to lay in goods, books, and stationery. I wore my old white great coat, and got its pockets full of goods—went into the cake shop, got some cake and candy and walked down the streets eating it, and mind I tell you every fellow we met gave us a look in earnest—such a fellow as I was rather novel even in the great city where everything may be found. I took care not to go where I was known. . . .[21]

Although Brainard might have been tempted by similar delights, he would have been embarrassed to be considered a country boy, and certainly would never have written home about it.

The faculty of Jefferson Medical School was particularly proud of its anatomical theatre, but they felt that the size of the museum was not commensurate with the other facilities. They were making pleas for improvement of the museum, as noted in the catalogue of 1833:

> Rich as the United States is in all the subjects of the Vegetable, Mineral, and Animal Kingdoms, and liberally supplied as Philadelphia, in particular, is, with Dead Bodies, there is no reason why they may not, in a very few years, have open for the examination and instruction of their pupils, a splendid and extensive collection of the various subjects of their lectures.[22]

The courses ran from November 1st to March 1st. Because the faculty had difficulty in covering the subjects in the allotted time, an additional two months of lectures were given in April and May—but this extension was optional. For

graduation two full courses were required. The same course was repeated each year. Fees were fifteen dollars for each lecture course, ten dollars for the use of the dissecting room, and five dollars for the dispensary and museum fees. There was an added twenty dollar fee for graduation—fifteen dollars for the diploma and five dollars to the janitor who "in consideration of his fee, provides for each Graduate, a handsome box for the preservation" of the diploma.[23] This made a total of $260 for medical education, plus the cost of books.

Brainard was fortunate since as he entered Jefferson Medical School, the institution was on the threshold of a period of undisturbed progress after a stormy beginning. Although intense rivalry existed between Jefferson Medical School and the University of Pennsylvania Medical School, both institutions had a sporting agreement to schedule the introductory addresses of the first school week at different hours so that all prospective students could circulate between the competing institutions, weighing the merits of the two faculties. So Daniel heard Granville S. Pattison conclude his address with a plea to the students of both schools:

> . . . I seize on the present to press most earnestly on you the propriety of your avoiding all hostility, and of cultivating feelings of the most perfect kindness in your intercourse with each other. . . . Do this . . . and you will repay the citizens of that community from whom you at present are receiving civilities and hospitalities by rendering the name of Philadelphia pre-eminent amongst other cities of your country, as the great emporium for medical instruction and science.[24]

Brainard learned that the speaker was the newly appointed professor of anatomy at Jefferson. Granville Sharpe Pattison was Scottish, as usual, and had been born and educated in Glasgow, where in 1813 he became a member of the faculty of Physicians and Surgeons of Glasgow. He served as assistant to the famous anatomist, Allan Burns, and later became the editor of the second edition of Burns' *Observations on the Surgical Anatomy of the Head and Neck.* He was noted for his knowledge of visceral and surgical anatomy and was considered

the best teacher of his time. Later, Alfred Stille was to write of Burns: "I shall never forget his lecture upon the skull, in which he recited with admirable feeling (while undoubtedly holding a skull in his hand) the famous line of Byron beginning 'Is this a place where a god might dwell?'"[25]

The professor of medicine was John Revere (1787-1847), the youngest son of Paul Revere. He was a graduate of Harvard, a private pupil of James Jackson, and then a graduate of Edinburgh in 1811. He returned to practice medicine in the United States and was appointed to the chair of medicine in 1831. One of his students wrote that Revere "always laid out his ground with great care, kept his subject carefully before him and presented it as a connected whole after a method so severe and exact that a student who would give it his undivided attention could not fail to receive important instruction."[26]

Jacob Green (1790-1841) taught chemistry at Jefferson from its inception until his death. From his childhood he was fascinated by science. He started as a boy with a collection of plants and at the age of twenty-four published "An Address on the Botany of the United States, to Which is Added a Catalogue of Plants Indigenous to the United States." He then extended his studies to mineralogy, conchology, chemistry, electricity and galvanism. Soon after graduation from the University of Pennsylvania, Green and a friend published "A Treatise of electricity," which gained him a reputation. He gave his students a view of the universality of science that helped counterbalance the more parochial view of medicine.

All these men lived in the shadow of George McClellan, the founder of the school and the head of surgery. He had glamour, brilliance and daring but he also had skill and ability and tremendous energy. McClellan pioneered in the removal of the parotid gland and in vascular surgery. His description of shock is considered a classic. Samuel Gross noted that a front row seat in the surgical classroom was sought after by the medical students, in spite of the danger of being punctured by the knife or scissors with which McClellan gestured as he talked. To this observation Gross added that in his lectures McClellan was "always brilliant, always interesting and instructive, but . . . superficial and scattering, apparently without any definite aim, forethought or preparation."[27] Gross once remarked that "every student was warmly attached to him, and 'Mac' was the

name by which he was generally designated."[28]

The two years at Jefferson sped by, even if the second year was a repetition of the first. This was because of the angle of approach. In the first year Brainard and other first year students were coached by the second year men, who appeared godlike in their wisdom. In the second year when Brainard and his friends were the coaches, they discovered that beyond the problem of knowing was the problem of teaching. The clinical courses came to life with seeing cases in the infirmary, the clinics, and the hospital, and even in the home for deliveries. The students became aware that education would be a continuing process and did not end with graduation.

At the end of his second year Brainard completed his thesis, was examined by his professors, graduated and returned home. In spite of Jefferson's many advantages, the two years there had far less influence on Brainard than had the one year at Fairfield. Fairfield had a firm goal to produce a competent general practitioner for a small and usually isolated community. Each instructor knew that his students would be practicing alone in a small town or farm community in New York or New England, or, still more isolated, in the Northwest Territory, or, remoter yet, in Oregon or California. In contrast, at Jefferson the instructor might have a few students of this type but the majority would remain in the towns and cities of the eastern and southern seaboards. Some would be going on to postgraduate study in England or on the continent. A few would be professors of basic science or clinical medicine or surgery.

Fairfield also had another related goal. The school emphasized that in whatever community the doctor practiced he would probably be the only source of teaching for the would-be medical students of that community, either as a preceptor or as a teacher in a second generation country medical school. However much Brainard had developed and matured at Jefferson, all his life he bore the indelible mark of a Fairfield graduate.

After graduation Brainard went home to his family and to Dr. Sykes, who had asked him to join in his practice. He was very fond of Dr. Sykes, and Dr. Sykes thought of him as a son as well as an assistant. The patients who came thought of him as the Brainard "boy" and probably really preferred to see Dr.

Fig. 5. Jefferson Medical School, founded in 1826. (Photo courtesy of Northwestern University Medical School Library.)

Sykes. As always, Brainard was preparing. Having only a smattering of Latin, he took classes at the academy. Although he read French, he didn't speak it well, so he took lessons in French conversation. He wanted to teach, so he taught a course in anatomy and physiology at the academy. He wanted to write well, so he joined the "Maeonian Circle," a group of young people who wrote and criticized each other's papers, and published a small quarto volume of their best work.

He was learning but he wanted to be doing. Time was slipping by too quickly; his world was too small, too safe, too stifling. To the west there was a wider world with a farther reach where a practice could be built, a school started, a reputation earned.

Then the young man who always had planned several years ahead and had known exactly what he was going to do abruptly decided to go west, destination unknown. With sadness and some remorse he told his parents and Dr. Sykes of his decision. He took his meager savings, got the boat to Detroit, bought a pony and followed the trail to Chicago.

Notes

1. James Nevins Hyde, *Early Medical Chicago: An Historical Sketch of the First Practitioners of Medicine, With the Present Faculties, and Graduates Since Their Organization, of the Medical Colleges of Chicago* (Chicago: Fergus Printing Company, 1879), 26. This account of Daniel Brainard's arrival in Chicago is based on the reminiscences of the Honorable J. D. Caton related to James Nevins Hyde and published by Hyde in *Early Medical Chicago* in 1879. Caton placed Brainard's arrival in 1835 and this date is used by subsequent authors who have followed this account. I have used the 1836 date, which I feel is a more reliable date since it was used by James van Zandt Blaney, who was Brainard's closest associate, by E. Fletcher Ingals and by Arthur B. Bevan, who relied on the Rush archives. See James van Zandt Blaney, "Opening Address at the Formal Inauguration of the New Building," *Chicago Medical Journal 24* (October 1867):493. See also E. Fletcher Ingals, "The Life and Works of Daniel Brainard," *Bulletin of the Alumni Association of Rush Medical College 9* (July 1912):2. Another source is Arthur B. Bevan, "Daniel Brainard," *Surgery, Gynecology and Obstetrics 56* (January 1933):123.

2. David Dudley Field, *The Genealogy of the Brainerd* [*sic*] *family in the United States. 1857* (New York: Printer S.F. Trow, 1857), 187-188. From the archives of the Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois.

3. Daniel Drake, "Practical Essays on Medical Education and the Medical Profession in the United States; Essay 1, Selection and Preparatory Education of Pupils," in *Medical America in the Nineteenth Century: Readings from the Literature*, ed. Gert H. Brieger (Baltimore: Johns Hopkins Press, c1972), 9.

4. *Ibid.* Essay 2, "Private Pupilage," 19.

5. George W. Corner, ed. *The Autobiography of Benjamin Rush: His "Travels through Life" Together With His Commonplace Book for 1789-1813* (Princeton, New Jersey: Princeton University Press, 1948), 38.

6. *Autobiography of Samuel D. Gross With Sketches of his Contemporaries*, edited by his sons (Philadelphia: George Barrie, 1887), 1:27-28.

7. Henry Wadsworth Longfellow. Attributed to him by his

son, Ernest W. Longfellow, *Random Memories* (Boston: Houghton Mifflin Co., c. 1922), 15.

8. William Frederick Norwood, *Medical Education in the United States Before the Civil War* (New York: Arno Press and the *New York Times*, 1971, c1944), 152.

9. Howard A. Kelly and Walter L. Burrage, *Dictionary of American Medical Biography* (New York: Appleton, 1928; reprint, Boston: Longwood Press, 1979), 1144-1145.

10. Norwood, *Medical Education*, 151.

11. George H. Weaver, "Beginnings of Medical Education In and Near Chicago: the Institutions and the Men," *Bulletin of the Society of Medical History of Chicago 3* (September 1925):378.

12. Norwood, *Medical Education*, 152.

13. Kelly and Burrage, *Dictionary*, 796.

14. Francis R. Packard, *History of Medicine in the United States* (New York: Paul B. Hoeber, c1931), *2*:739.

15. Kelly and Burrage, *Dictionary*, 1153.

16. *Ibid*, 86-87.

17. Norwood, *Medical Education*, 152.

18. *Ibid*, 152-153.

19. Andrew Boardman, "An Essay on the Means of Improving Medical Education and Elevating Medical Character," in *Medical America in the Nineteenth Century: Readings from the Literature*, ed. Gert H. Brieger (Baltimore: Johns Hopkins Press, c1972), 26-27.

20. Edgar Carlisle McMechen, *Life of Governor Evans, Second Territorial Governor of Colorado* (Denver: Wahlgreen Publishing Co., c1924), 16.

21. *Ibid*, 18.

22. *Annual Announcement of lectures, &c. &c. &c. By the Trustees and Professors of Jefferson Medical College, Philadelphia: for the year MDCCCXXXII* (Philadelphia: Clark & Raser, 1832), 4-5.

23. *Ibid*, 11.

24. Norwood, *Medical Education*, 93.

25. Willene Hendrick and George Hendrick, eds. *On the Illinois Frontier, Dr. Hiram Rutherford, 1840-1844* (Carbondale, Illinois: Southern Illinois University Press, 1982), xvi.

26. *Ibid.*

27. Kelly and Burrage, *Dictionary*, 773.

28. *Autobiography of Samuel D. Gross*, 1:33.

Chapter II
Hanging Up a Shingle

On arriving in Chicago in 1836 Brainard looked for the office of his friend, J. D. Caton, who had started his practice of law there. Caton described his arrival as follows:

> Dr. Brainard rode up to my office, wearing pretty seedy clothes and mounted on a little Indian pony. He reported that he was nearly out of funds, and asked my advice as to the propriety of commencing practice here. We had been professional students together in Rome, N.Y., when he was there in the office of Dr. Pope.... I advised him to go to the Indian camp, where the Pottawatomies were gathered, preparatory to starting for their new location west of the Mississippi River, sell his pony, take a desk or rather a little table in my office, and put his shingle by the side of the door, promising to aid him, as best I could, in building up a business.[1]

Daniel sold his pony, made his sign, bought a table, and started to practice in Caton's office. He not only practiced in the office—he slept there as well, with his knapsack as his pillow.[2]

Before starting his practice Brainard made courtesy calls on the established physicians. The most easily recognizable, since he was over six feet tall and weighed 280 pounds, was Phillip Maxwell, the surgeon at Fort Dearborn. One of the events of

the day was to see him mount his favorite grey horse to dash through the streets "with all the chic and erectness of a soldier, and the abandon and insouciance of an Indian."[3] The most senior of the doctors was Elijah Harmon, who was the first civilian physician in Chicago. He had arrived in 1830 from Vermont with a case of rusty instruments, a library of one hundred volumes, and a stock of medicine.[4] Brainard also met John Temple who, in addition to practicing medicine, had the contract for carrying the mail between Chicago and Ottawa. On January 1, 1834, he initiated the route, driving an elegant thorough brace post-carriage shipped from Detroit. On that first trip the carriage was empty because there was no mail to carry.[5]

The second doctor to settle in Chicago was Edmund S. Kimberly, who opened a drug store with Peter Pryne. They competed in business with a pharmacy previously started by Philo Carpenter in 1832. Kimberly rejoiced in contacts and was active in public health, education and politics.[6] Then there was that fine old Irish gentleman, William Bradshaw Egan, described "standing on the prairie, a large fur cap on his head, an enormous Scotch-plaid cloak . . . belted around his Brobdignagian [sic] waist, and shod with buffalo overshoes."[7] In addition to his practice Egan was engaged extensively in real estate. The conditions of transfer were known as "canal-time." One of Egan's patients once complained that when she asked him how to take her medicine, he replied, "a quarter down and the balance in one, two and three years."[8]

Brainard also met Josiah Goodhue, a man of tremendous charm and boundless energy with a good mind and wide interests. Goodhue became his closest friend. Born in Vermont and graduated from Yale Medical School in 1829, Goodhue had practiced for a short time in Canada before coming to Chicago in 1832, where he now had the largest practice in the city.[9] He still had time to design the seal for the city of Chicago, serve on the school board and engage in real estate deals.

The physicians saw in Brainard a young man, six feet tall, with an erect carriage and striking steel blue eyes. His speech was direct to the point of abruptness. A reserved manner and a luxuriant moustache hid his shyness and his youth. Only with old friends did his enthusiasm bubble forth and his humor sparkle.

After the land sale of 1833 there had been an influx of about twenty-five physicians. Josiah Goodhue said of these newcomers:

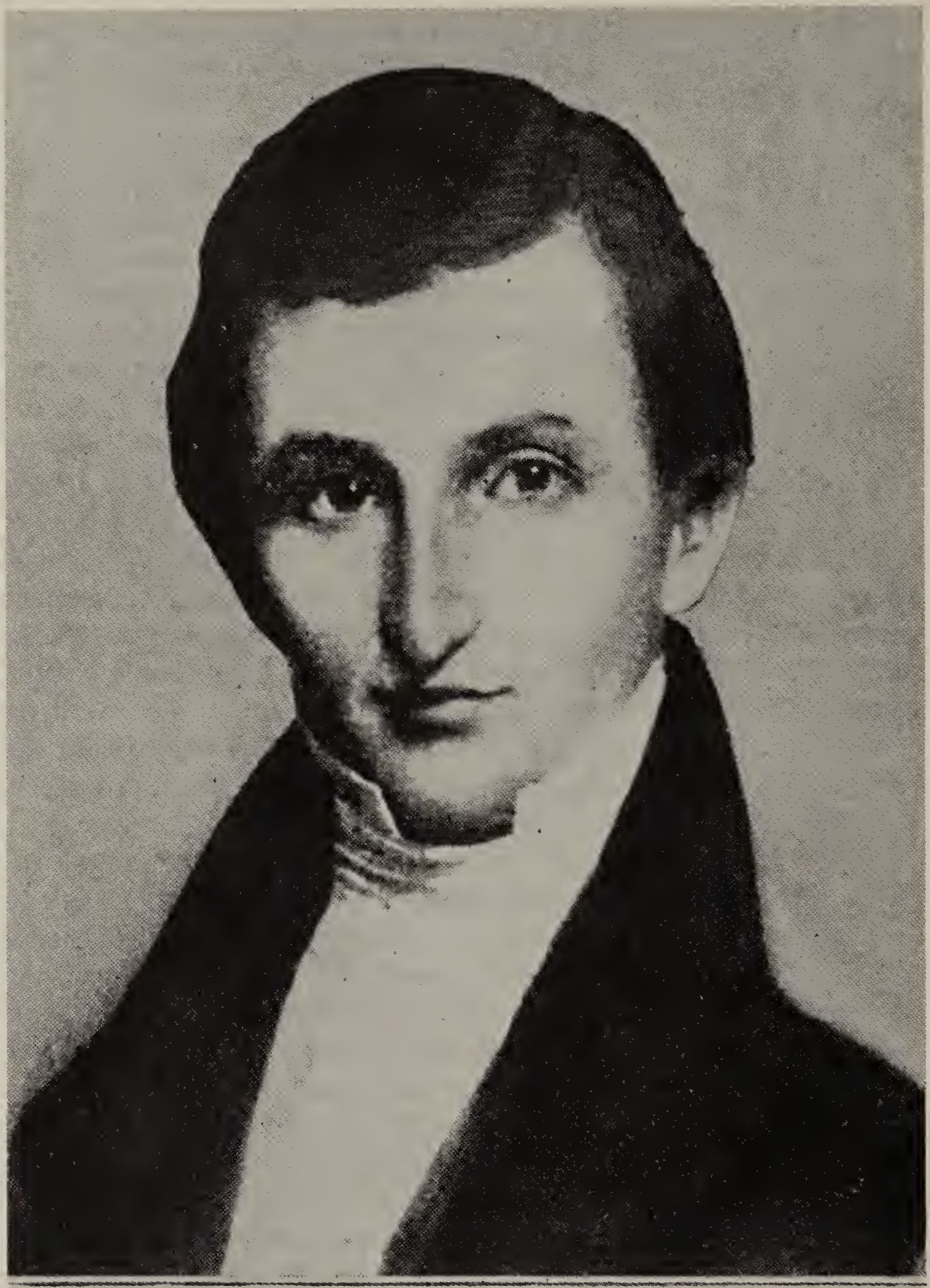
> Anterior to eighteen hundred and forty, nine-tenths of all the physicians who had located themselves in this region, had done so with reference to pursuing agriculture, and with the avowed intention of abandoning medical practice; most of whom, either from the necessity of the case, or from finding more truth than poetry in pounding out rails, resumed their profession, and divided their attention between farming and medicine.[10]

With this doctor-patient ratio of one to a hundred, Daniel Brainard's practice grew slowly. He was busy because he accepted every patient who came for help. However, the majority of his patients were not able to pay in money or even produce or service as was customary.

One of the cases that helped to establish his practice in the community came to Daniel because he was in the same office with Caton, who later related this story:

> A schooner was wrecked south of the town, on which were a man and his wife, who escaped with barely their clothes on their backs. They were rather simple people, and belonged to the lowest walks of life. They started for the country on foot, begging their way, and, when distant some twelve miles, encountered a party of men with a drove of horses, one of whom pretended that he was a sheriff, and arrested them for improper purposes. When they were set at liberty, they returned to the town, and came to me for legal advice, the woman being about five months advanced in pregnancy. I commenced a suit for the redress of their grievances, and the doctor took an active interest in their welfare.[11]

Brainard found the couple a small house and appealed to the ladies of the community for provisions and furnishings. Although the pregnancy was troubled, a fine healthy baby was



EDMUND STOUGHTON KIMBERLY

Fig. 6. Edmund Stoughton Kimberly (1803-1874). (From History of Medicine and Surgery and Physicians and Surgeons of Chicago. *The Biographical Publishing Corporation, Chicago, 1922, page 26. Photo courtesy of Library of Rush University.)*

delivered and the mother recovered her health and her faith. The community was much impressed with Dr. Brainard's goodness of heart and skill.

In January 1837 Brainard was called to see a laborer who had been working on the Illinois-Michigan Canal. The man, unable to perform his job because of pain and swelling in his leg, had walked to Chicago to seek medical help. Questioning revealed that nine months previously he had fractured the leg while working on a New York canal project. The leg had healed slowly, but as soon as he was able the man had taken a canal boat to Buffalo, a steamboat to Detroit, and then walked a distance of 250 miles to the site of the Illinois-Michigan Canal. Soon after his arrival he noticed increased swelling at the level of the fracture. The swelling was accompanied by so much pain that he was unable to eat or sleep and was losing weight.

The doctors of the community consulted together and Brainard was selected as the surgeon. Although Brainard had wanted to amputate at the hip, the consensus was to operate at the upper thigh. Daniel was assisted by Josiah Goodhue, and Dr. Walker occluded the femoral artery because reportedly he had the best thumbs of any man in Chicago.[12] When the thigh amputation showed that the bone cavity was filled with tumor, Daniel proceeded to amputate at the hip. The wound healed, but later there was hemorrhage and evidence that the tumor had spread to the abdomen. When the patient finally died on the forty-eighth day, an autopsy revealed widespread tumor.

The skill that Brainard showed in his surgery established him as the leading surgeon of the area. Following the precepts so firmly laid down by his Fairfield teachers, Brainard wrote up the case and on March 10 sent the report off to the *American Journal of the Medical Sciences*, where, to his great satisfaction, it was published in the August issue of 1838.[13]

Although he was becoming established as a surgeon, it was still necessary for Brainard to do a general practice. The summer of 1838 went down in local history as the "sickly season of '38." Brainard's letter to the *Medical Examiner* discussed the characteristics of the fever prevalent that summer:

> During the months of July and August, 1838, the remittent fever made its appearance. It usually

commenced by languor, loss of appetite, and diarrhoea. These were followed by pains in the head and limbs, chills or rigours, frequent pulse, burning heat, and great thirst. . . . Nausea and vomiting were common attendants of the first state. Tenderness on pressure of the epigastrium occurred in about half the cases. The urine was usually scanty and red, until convalescence.

The duration of the disease varied from three or four days to as many weeks. . . . The subjects of this fever are mostly the labourers on the Illinois and Michigan canal, and the settlers along the larger streams. . . . The traveller, Dwight, (as quoted in Armstrong's Lectures,) observes that the borders of clear lakes are healthy, while those of muddy and stagnant waters are the reverse. This observation I believe to be generally correct. In regard to the proportion of cases that prove fatal, it is difficult to speak with certainty; but, according to my observations, about one in sixteen terminates fatally. . . . The treatment varies with each case.[14]

In Brainard's hands it was relatively mild and supportive. He did not approve of the usual treatment, which he goes on to describe:

> The usual routine of treatment in northern Illinois, is calomel, in large doses, from first to last. Forty grains is considered a moderate dose, and 3jss. is often given. Much harm, I am sure, results from the indiscriminate use of this article. In persons of delicate constitution, and in those weakened by previous disease, it is apt to produce ptyalism, and in all cases it is liable to leave behind chronic irritation of the bowels, which is not free from danger.[15]

Brainard then proceeded to give findings on the autopsies which he observed. It is evident that he was aware of the efforts of William Wood Gerhard to differentiate between typhoid and typhus on the wards of Pennsylvania Hospital, and he had probably read Gerhard's paper, "On the Typhus Fever, Which

JOSIAH COSMORE GOODHUE

Fig. 7. Josiah Cosmore Goodhue (1794-1847). (From History of Medicine and Surgery and Physicians and Surgeons of Chicago. *The Biographical Publishing Corporation, Chicago, 1922, page 20. Photo courtesy of Library of Rush University.)*

Occurred at Philadelphia in the Spring and Summer of 1836," published in the *American Journal of the Medical Sciences* in 1837.

Brainard found it difficult to make ends meet and eked out his income by writing editorials and editing other material for the *Chicago Democrat.* He was also giving lessons in anatomy to a group of eager young men who had been drawn to him by his ability and enthusiasm. This tutoring gave impetus to Brainard's secret dream of starting a medical school. In the late autumn of 1836 Daniel Brainard and Josiah Goodhue drew up an act of incorporation for Rush Medical College and presented it to the legislature. On March 2, 1837, the act was passed by the Illinois General Assembly.[16]

Unfortunately, only a month later the Panic of 1837 hit Chicago, and men who had had money to endow a medical school the year before were now scrambling to support their own families. The panic was the result of overextension of credit, withdrawal of bank funds for purchase of government land, the failure of the wheat crop in 1836, and a 50 percent drop in the price of cotton. As a result, by May almost every bank had suspended specie payment. So 1837 was a sad year. Brainard's dreams of a medical school were laid aside along with many other men's dreams.

The next two years were difficult ones for a growing nation, for a brash city and for an eager young physician. Brainard worked hard but without much payment. He studied and wrote but without his usual enthusiasm, for he had always needed a goal or a dream. With the plan for a medical school in abeyance, he revived an old dream—to walk the wards of the Paris hospitals. The old dream now became the new goal, and he decided to go to Paris for postgraduate study.

Notes

1. James Nevins Hyde, *Early Medical Chicago: An Historical Sketch of the First Practitioners of Medicine With the Present Faculties, and Graduates Since Their Organization, of the Medical Colleges of Chicago* (Chicago: Fergus Printing Company, 1879), 26.
2. William K. Beatty, "Daniel Brainard—Pioneering Surgeon and Teacher," *Proceedings of the Institute of Medicine, Chicago 34* (January-March, 1981):2.
3. William H. Bushnell, *Biographical Sketches of Some of Chicago's Early Settlers*, Fergus Historical Series No. 5 (Chicago: Fergus Printing Company, 1876), 11.
4. Hyde, *Early Medical Chicago*, 12-18.
5. *Ibid.*, 22.
6. *Ibid.*, 24.
7. *Ibid.*, 23.
8. *Ibid.*, 24.
9. *Ibid.*
10. J. C. Goodhue, "Address Before the Rock River Medical Society," *Illinois and Indiana Medical and Surgical Journal 1* (August 1846):261.
11. Hyde, *Early Medical Chicago*, 26-27.
12. *Ibid.*, 28.
13. Daniel Brainard, "Amputation at the Hip Joint," *American Journal of the Medical Sciences 22* (August 1838):372-376.
14. Daniel Brainard, "Character of the Fevers Prevalent at Chicago, Illinois, in 1838, '39." *Medical Examiner* (Philadelphia) *2* (November 9, 1839):715-716.
15. *Ibid.*, 716.
16. George H. Weaver, "Beginnings of Medical Education In and Near Chicago: The Institutions and the Men," *Bulletin of the Society of Medical History of Chicago 3* (September 1925):357.

Chapter III
Paris Interlude

His decision made in the late autumn of 1839, Brainard wrote to New York for passage to LeHavre, obtained his passport, talked to his patients and closed the office. Then he packed his meager belongings and his French dictionary and grammar, wrote his family, and took the lake boat to Buffalo.

Not until he boarded the packet in New York did he actually believe that he was on his way to Paris. A packet was a small, swift sailboat that carried mail and took a few passengers. A winter crossing was rough and took about three weeks; this was considered so fast that the boat was called a flash packet, or simply a "flash." The mail received more care than the passengers who slept and ate with the crew and the officers. The passengers were mostly businessmen and traders with an occasional diplomatic courier, divided about equally between Americans leaving home and French returning home. They all were literally thrown together. Daniel practiced his French, discouraged by all the different accents and idioms of his teachers, but encouraged by their friendliness and enthusiasm. When the ship reached LeHavre, he took the coach to Paris with several of his fellow travelers. He sat with his eyes glued to the small isinglass window of the coach, catching glimpses of the snow-covered countryside. Then one evening it was the lights of Paris he was seeing and the coach rattled to a stop on a cobblestone street.

The Paris Brainard saw from his window had been through a revolution, the Napoleonic wars, the restoration, the return and defeat of Napoleon, and since 1830 the rather benign rule of Louis Phillippe. As a result, it was bedraggled and dirty but there was an undercurrent of the enthusiasm and freedom brought by the revolution.

When Daniel awoke the next morning, he pulled out his map and by candle light located himself and his landmarks—the school of medicine, the Hôtel Dieu and the Hospital de la Charité. After a quick breakfast in the cafe and the fun of reading the free papers, he took a cabriolet to the Place de l'École de Medecine and presented himself to the Bureau with his passport and his diploma. An elderly employee who spoke excellent English urged him to go right into the lecture hall, where he would have the privilege of hearing the great Orfila lecture. He could return later to complete the formalities of the "card."

Entering the great auditorium Brainard saw that the seating was in a semicircle with the benches rising steeply and filled with over a thousand medical students, seated with decorum and with their hats off, in accordance with a legislative decree.[1] He managed to edge himself on to a bench, just as Orfila walked in with a brisk, firm step. The lecturer had brilliant dark eyes, dark complexion, and dark hair (a wig). His deep tenor boomed out over the bent heads of the students scribbling in their notebooks. Daniel had trouble following the rapid speech. After the lecture the student seated next to him explained that Orfila was Spanish, dean of the faculty, a brilliant chemist, and *the* authority on legal medicine. Not mentioned was his reputation as a very astute stockbroker who had made a fortune in the market.[2]

Brainard retraced his steps to the Bureau, where he received the card which allowed him to attend any of the lectures held at the school. As he left Brainard admired the bas-relief over the entrance—a representation of the French King with Wisdom and Beneficence granting privileges to Surgery. He liked even better the bas-relief over the tympanum—a representation of Theory and Practice joining hands on an altar.[3]

The next day he went to Hôtel Dieu, where his heroes, Dupuytren and Larrey, Napoleon's surgeons, had operated. This was one of the oldest hospitals in Europe, having been

founded in 660 by the bishop of Paris. It had grown more crowded each year, until in 1709, the daily census was said to be nine thousand. Since the revolution conditions had been greatly improved. The number of beds had remained the same but because now each bed had only one patient, the census in 1840 was approximately 800. The patients were cared for by sixty nurses of the order of St. Augustin, ten physicians, three surgeons, thirty-two internes in medicine, surgery and pharmacy, one hundred and twenty-four externes, and one hundred and forty servants.[4]

At the medical school Brainard got his ticket at the director's office on presenting his diploma. He made surgical rounds with Philippe Roux, who had succeeded to the position of chief surgeon after the death of Guillaume Dupuytren. With fifty students there was not much he could see nor did he find Roux a very good lecturer.

The next day he left very early to go to Hospital de la Charité to follow Alfred Velpeau, the surgeon in chief, who began rounds at seven. Velpeau was of medium height, garbed in a black dress coat (he changed to a gray morning coat when he made rounds). He carried himself stiffly, this posture being most marked in the neck, so that he did not turn his head but his whole body. Gray hair stood out from his head in a bristly aura, and his sharp bright gray eyes were overhung by broad shaggy white eyebrows. Velpeau was clean shaven and was said to have a horror of whiskers and mustaches.

Rounds were informative, but there was such a large crowd that neither Daniel nor anyone else could see or hear well. He was also made uncomfortable by Velpeau's harsh manner with patients, and even rougher treatment of his internes and externes. After rounds Velpeau proceeded to the amphitheatre for surgery followed by a lecture. As a surgeon he was cool and collected but not a quick operator. As a lecturer he was outstanding: the lecture was well organized; he knew his subject; and every effort was made to clarify indications and contraindications to any surgical solution of a problem. Complications were discussed in detail.[5]

Velpeau's books were very popular in the United States. His book on surgery had been translated by Valentine Mott, the leading surgeon in New York, and his book on obstetrics by Charles Meigs, Philadelphia's leading obstetrician and

gynecologist. Daniel had studied and admired Velpeau's book on operative surgery.

After the lecture he went to the Jardin des Plantes, the finest botanical garden in Paris. After the winter grayness of the city, the hothouses were a fairyland of blossoms and foliage and the surrounding grounds were the home for a giraffe, bisons, vultures, eagles and other animals.[6]

The next day Brainard visited the two dissecting rooms. The first was the école pratique, of the medical school; and the second was the amphitheater recently built by the hospitals.

The école pratique was conveniently close to the medical school. The rooms, accommodating two hundred students at a time, were dirty and damp, and wet in winter. Winter was the only time these rooms could be used for dissection, however, because of the stench of decaying bodies in the summer. Private classes could be obtained from the chief of dissecting rooms or one of the associate professors. The new dissection rooms had been built by the hospitals' administrators for their interns and externes. There were four very long well lighted rooms with tables. An interesting museum, a lecture room and several private dissecting rooms completed the building. The chief and two prosectors superintended the general dissection, delivered lectures and demonstrated twice a day.[7]

Thus postgraduate students as well as medical students could attend free the regular lectures at the medical school and the hospital lectures and demonstrations. In addition there were innumerable private courses available for a fee. These courses were popular with the foreign students because they were small and thus allowed for individual instruction, and because a group of foreign students could arrange to have courses given in their own languages. Bills containing notices of days and hours of courses and lectures were posted near the medical school and dissection rooms.

After his first quick survey of courses and lectures, Brainard felt dizzy with all the opportunities available. He decided that he would do rounds and lecture with Velpeau in the mornings at the Charité, dissection and lectures at the new amphitheater in the afternoons, and as many of the other lectures and rounds as he could fit in.

These plans influenced where Daniel would look for lodgings. He wanted to be near the Rue de Moulin where the dissection

rooms were located, near the Charité, and not far from the school and the Hôtel Dieu. A number of small hotels and innumerable pensions were available on the south side of Paris, near the school, but these accommodations ranged from good to horrible. After seeking advice from fellow students, Daniel found suitable lodging. He then figured that his average expenses, at five francs to the dollar, would be:

Room, 40 francs per month	480
Servants' tips, 8 francs per month	96
Breakfast, 25 sous	457
Dinner, 3 francs	1,095
Fuel (very high)	150
Attendance at hospitals and lectures	free
Private courses	350
Sundries and extras	372
	3,000 francs ($600)

This total did not include clothing or other expenses unrelated to education. For this reason, the average English and American student figured $800 to $1,000 for the year. French and Italian students were said to be able to make it on $200.[8]

In this period the American students numbered roughly forty to fifty per year. Among them were Oliver W. Holmes, James Jackson, Jr., Henry I. Bowditch, Elisha Bartlett, George C. Shattuck, Alonzo Clark, Ferdinand C. Stewart, Alfred Stille, William W. Gerhard and Samuel G. Morton. Most of these men were physicians and were students of Pierre Louis, the famous internist and founder of medical statistics. Daniel was one of the few surgeons. The British students, too, were primarily of a medical orientation rather than a surgical one. The German students were the largest group and more of them were interested in surgery.[9]

After a month Brainard's schedule fell more or less into place—the mornings at the Charité with Velpeau or one of the other surgeons, the afternoons in the dissection room or studying at the Museum Dupuytren, followed by a lecture and dinner with friends at a cafe, and then home to study. He was making a few friends, and on an occasional evening they went to the theatre or the opera. With Brainard's interest in sketching, discovering the treasures of the Louvre opened up a whole new world. He often spent Sunday afternoons wandering

through the galleries or looking at book stores.[10]

Two years of hard work devoted to dissection and investigation went by all too quickly. He was always grateful later that he had been a part of Paris medicine when hospital medicine was at its height, when the freedom engendered by social revolution had brought a revolution to medicine itself, and when medicine and surgery were united by a group of brilliant men who had insight from both fields, from internists like Laennec and Trousseau to surgeons such as Dupuytren, Larrey and Velpeau. From these two years Brainard had become, scientifically, an investigator and a problem solver. Professionally he was firmly grounded in anatomy, pathology and surgical technique. Personally he had grown more tolerant and mature. The only negative effect was an intangible one. The surgeons whom he had admired had been hardened by long, arduous military service so that some of them appeared cold, arrogant and imperious, although beneath the surface they were men of integrity and kindness. For Brainard, however, whose shyness and introspection were already often interpreted as coldness and reserve, a gentler and more approachable model might have modified rather than reinforced these characteristics in him.

For all his life Paris would be the promised land where Daniel Brainard could lay aside professional and personal responsibilities, ignore the struggles for position and power, and be a student of science and art.

Notes

1. George Rosen, "An American Doctor in Paris in 1828; Selections from the Diary of Peter Solomon Townsend, M.D.," *Journal of the History of Medicine and Allied Sciences 6* (Winter 1951):81-82.

2. Erwin H. Ackerknecht, *Medicine at the Paris Hospital, 1794-1848* (Baltimore: Johns Hopkins Press, 1967), 41.

3. F. Campbell Stewart, *The Hospitals and Surgeons of Paris; An Historical and Statistical Account of the Civil Hospitals of Paris With Miscellaneous Information and Biographical Notices of Some of the Most Eminent of the Living Parisian Surgeons* (New York: J. and H. G. Langley, 1843), 130.

4. *Ibid.*, 30-34.

5. *Ibid.*, 409-415.

6. Rosen, "An American Doctor," (Spring 1951):241.

7. Stewart, *Hospitals and Surgeons of Paris*, 142-145.

8. *Ibid.*, 174-175.

9. Ackerknecht, *Medicine at the Paris Hospital*, 191-194.

10. As the reader will have noted, Daniel Brainard was neither a letter writer nor a diary keeper, but many of his contemporaries were. This account of his daily schedule is based on the schedules of these contemporaries and a knowledge of the physicians with whom Brainard studied and the places where he worked.

Chapter IV
The Founding of Rush Medical College

In 1841 Brainard returned to Chicago. The warm welcome of his friends and patients made him feel, to his shy surprise, that he had come home. He missed Josiah Goodhue, who had moved to Rockford, so he rode there on the old Galena trail for a weekend of continuous talk. When he returned, Brainard opened his office, put up bookshelves in the back room, and arranged his precious books.

Chicago at the time was recovering from the Panic of 1837 and becoming a trade and transportation center. The settlers of Illinois, Indiana and Wisconsin were producing grain and livestock in excess of their own community needs. In 1841 Chicago merchants shipped 210 bushels of wheat; in 1842 its merchants shipped 586,907 bushels.[1] There was a similar record for lumber and many other products. Construction of the Illinois-Michigan Canal was resumed; the port had to be dredged continually for bigger ships.

Brainard's practice grew rapidly with many referrals, especially for complicated fractures. He once more felt the excitement of setting a fracture, operating, making decisions and solving problems. Once again he dreamed the dream of starting a medical school. Students interested in instruction in anatomy were coming back—former ones to hear about what he had learned in Paris and new ones to be grounded in the fundamentals.

That fall Charles Pope, who had been a fellow student in

Fig. 8. Dr. Brainard's office, 1844. (Photo courtesy of Chicago Historical Society.)

Paris, asked Brainard to teach anatomy in the school he was starting in St. Louis (which would later become the St. Louis Medical College). The new school faced stiff competition from Missouri College, founded by J. N. McDowell in the same city. McDowell, when he gave the valedictory address at his college, always made some remark about the other college. With typical bombast he declared in one address that "the spirit of Dr. McDowell will arise upon ethereal wings. . . . Then it will take a swoop, and when it passes this building, it will drop a parting tear, but, gentlemen, when it gets to Pope's College, it will expectorate."[2]

Brainard accepted the offer and enjoyed his time in St. Louis. He worked hard to polish his lectures and demonstrations, and he learned firsthand the problems of starting a new school by watching his friend Pope struggle through perils and pitfalls.

While he was in St. Louis he met James van Zandt Blaney, a young physician who had come to Jefferson Barracks as an army surgeon. Blaney had been born in New Castle, Delaware in 1820. A brilliant student, he graduated from Princeton College in 1838 and stayed on for a year of postgraduate study in chemistry with Professor John Henry. In 1842 Blaney graduated from the Medical Department of the University of Pennsylvania with a thesis on "The Investigation of the Vegetable *Materia Medica*."[3]

Brainard persuaded Blaney to return to Chicago with him as professor of chemistry in an as yet unfounded medical school. When Brainard came back to Chicago, he found that three new medical schools had sprung up in the region like prairie flowers: the Medical Department of LaPorte University in Indiana and the Franklin Medical School at St. Charles, Illinois, both organized in 1842, and the Illinois College Medical School at Jacksonville, about to open in 1843.[4] These schools were all headed by men who were graduates of Fairfield: Daniel Meeker of LaPorte, George Richards of St. Charles, and David Prince of Jacksonville. They had been as thoroughly imbued with the importance of teaching medicine as had Brainard.

The opening of three schools in the vicinity forced Brainard to open his school before he had a building. So without further ado, he rented two small rooms in the "saloon" building, and set up a dissection room at the back of the office. In a letter dated

October 10, 1843, he recruited John McLean of Jackson, Michigan with the following words:

> If, however, you would give a course on *materia medica,* or of practice of medicine, I should be happy to have you do so. The number of students for the first course, at this late period would probably be from twenty to thirty. If there are any from Michigan, perhaps more. The fees would do little more than pay expenses, but this would prepare us for a second course. I have been several years engaged in giving private courses of anatomy and surgery. I think it urgent there should be a commencement made this season. . . . By commencing at present a number of students might be prevented from going from this region to other places and thus give advantages to other schools.[5]

John McLean accepted—after all he was a Fairfield man. He came from Caledonia, a small town in New York. The money McLean earned teaching school had enabled him to go to medical school at Fairfield. After graduation he had moved to Jackson, Michigan.[6]

Moses Knapp, who had graduated first in the first class of Jefferson Medical School and who had recently come to Chicago, accepted Brainard's offer of the chair of obstetrics. Fortunately Brainard had James Blaney to teach chemistry and he himself taught anatomy and surgery. As soon as the faculty was organized, a circular was published.

While the circular was being written, it suddenly occurred to Brainard that he had not selected a name for his school. According to the widow of A. W. Davisson, the prosector in anatomy at the school in 1843-1844, Brainard decided to name the school for Benjamin Rush, the most prominent physician of the Revolutionary period. Behind this gracious gesture was the hope that the school might receive a substantial gift from the family. The response from the widow and her two sons, however, was a polite "thank you," and no money.[7]

On October 21 Brainard wrote McLean that all the appointments had been made for one-year terms set to expire May 1, 1844. Then he ended his letter with a question: "Will

you inform me how I can forward to you a number of circulars for distribution, or, if there is no other way than the mail, give in your letter a catalogue of names and I will send them?"[8]

The school opened on December 4, 1843, with twenty-two students seated on two wooden benches. The term went very quickly, with all the teachers struggling to keep one lesson ahead of their students. The end of the term marked the beginning of a hectic summer. Money needed to be raised, a building erected, a board of trustees selected, the faculty reorganized and more students recruited.

Because obtaining the best board of trustees required tact and persuasion, Brainard decided to seek advice from the politically astute Dr. Kimberly. The two of them discussed the possibilities. Getting William B. Ogden as president was considered a real plum. Grant Goodrich was secretary and Mark Skinner treasurer. The other members of the board were Dr. R. S. Kimberly, the Honorable Thomas W. Smith, James H. Collins, Justin Butterfield, John H. Kinzie, John Gage, Julius Wadsworth, Hugh T. Dickey, Walter L. Newberry, George W. Snow and N. B. Judd. The ex officio members included three state officials: The Honorable Thomas Ford, governor; the Honorable John Moore, lieutenant governor; and the Honorable Samuel Hackleton, speaker, plus Daniel Brainard, president of the college.[9] Brainard and Kimberly looked at the final list with real satisfaction; all the "doers" in Chicago were on the list, and it was hoped they would all become donors.

The cloud that loomed over the project was lack of money. The land had been donated by Walter Newberry, Thomas Dyer, William Ogden and Arthur Bronson. These men were interested in real estate north of the river and gave the land as inducement for the school to locate on the north side. They also gave $500 toward the building.[10] Many other people subscribed liberally. Stock certificates of $50 par value were also sold. The balance was made up by the faculty members. In a note to Dr. McLean on July 2, 1844, Daniel stated: "We would find no difficulty in raising this sum were it not that I wish also to build me a house this summer and do not, therefore, feel able to do as much as I would otherwise be most happy to do. . . ."[11]

Finally all the money was at hand. Mr. John M. Van Osdel was selected as architect and builder and the foundation was dug at 77-79 North Dearborn (Grand and Dearborn Streets

Fig. 9. View of Chicago from the prairie. (Engraving from A New and Popular Description of the United States, *by Robert Sears, New York, 1848. Photo courtesy of Chicago Historical Society.)*

today).

On July 17, 1844 James Blaney wrote to Dr. McLean:

> The buildings is [sic] to be of brick, 60 by 30 ft., with a portico in front and Doric columns, on the first floor will be the lecture room for chemical lectures, i.e., 35 by 40, back of that two rooms, one for a cabinet and apparatus room, the other for a laboratory. Above will the Anatomical Theatre, and back of it a museum and Dissecting rooms. The whole will cost about $2,300.00. There will be an additional expense of several hundred dollars, in arranging the grounds, and building the outhouses.[12]

Blaney's estimate was short by a considerable amount—the final figure was $3,500.

During the summer the faculty was also reorganized. The greatest achievement was the enticement of Austin Flint[13] to become professor of medicine. He had graduated from Harvard Medical School in 1833 and had taught in Buffalo since 1836. Like Brainard, Flint had been much impressed by Laennec's advances in the physical diagnosis of respiratory and cardiac disease, and was one of the first physicians in this country to become proficient in the use of the stethoscope. The appointment of Flint allowed James McLean to concentrate on *materia medica* and therapeutics.

James Blaney continued to teach chemistry. William B. Herrick was appointed lecturer of anatomy.[14] He was a graduate of Dartmouth Medical College and had been demonstrator in anatomy at the Louisville Medical Institute until he moved to Hillsboro, Illinois in 1839. This latter appointment allowed Brainard to concentrate on the surgery lectures and demonstrations. Moses Knapp was replaced by Graham Fitch, who taught obstetrics for a year and then medicine for five years.[15] He had trained with his father and then with Dr. Townsend in Geneva.

The faculty consisted of Brainard, president and professor of surgery, then thirty-two years old; Blaney, professor of chemistry, twenty-four; Flint, professor of medicine, thirty-two; McLean, professor of *materia medica,* thirty; Herrick, lecturer of anatomy, thirty-one; and Fitch, professor

of obstetrics, thirty-four. This very young faculty was reassured that summer when Daniel Drake visited Chicago, gathering material for his monumental book, *Diseases of the Mississippi Valley*, and stated that geographically, at least, Cincinnati, St. Louis and Chicago would be the medical centers of the area.[16]

The summer of 1844 sped by because both Blaney and Brainard had busy practices. Blaney wrote McLean in June:

> I fear that it will not be in my power to visit you this summer, as you have kindly invited me to do. I expect to stay here and attend closely to the practice. I am doing some practice and have besides the appointment of Physician to the Harbour, for which I receive $26.00 per month. As the bill for western rivers has passed, perhaps 50 men will be engaged in the harbour when I shall receive $40.00 per month. I shall thus be able to stay in town and pay my expenses.[17]

Six weeks later Blaney wrote: "I am doing just now a pretty good practice, with prospect of its continuance. We are having diarrhoeas, dysenteries and cholera infantum pretty frequently."[18]

Blaney, with the aid of Brainard, was also editing the *Illinois Medical and Surgical Journal*, which they had seen proudly off the Fergus Press in April of 1844. It was the first medical journal in Illinois (as well as in Indiana and Wisconsin), and brought to its readers the latest advances in medicine in the United States, England and France. The journal had reviews of useful books and its editors tried to keep its readers aware of epidemics. It afforded its readers a place to publish their own articles and observations. Last but not least, it was a good advertisement for Rush Medical School.[19]

Starting a journal had numerous features in common with starting a school, however. Everything that could go wrong did, as Blaney reported to McLean in a letter dated June 8:

> After my return to Chicago, I was very busily engaged in the issue of the May No. of the Journal. As it was issued late, I immediately after finishing

ANNUAL ANNOUNCEMENT

OF THE

RUSH MEDICAL COLLEGE,

CHICAGO.

SESSION 1843-4.

CHICAGO:
PRINTED AT THE DEMOCRAT OFFICE.
1843.

Fig. 10. Annual announcement of Rush Medical College, 1843-1844. (From George H. Weaver, "Beginnings of Medical Education in and near Chicago" in Bulletin of the Society of Medical History of Chicago, *vol. 3, no. 4, page 375, September, 1925.)*

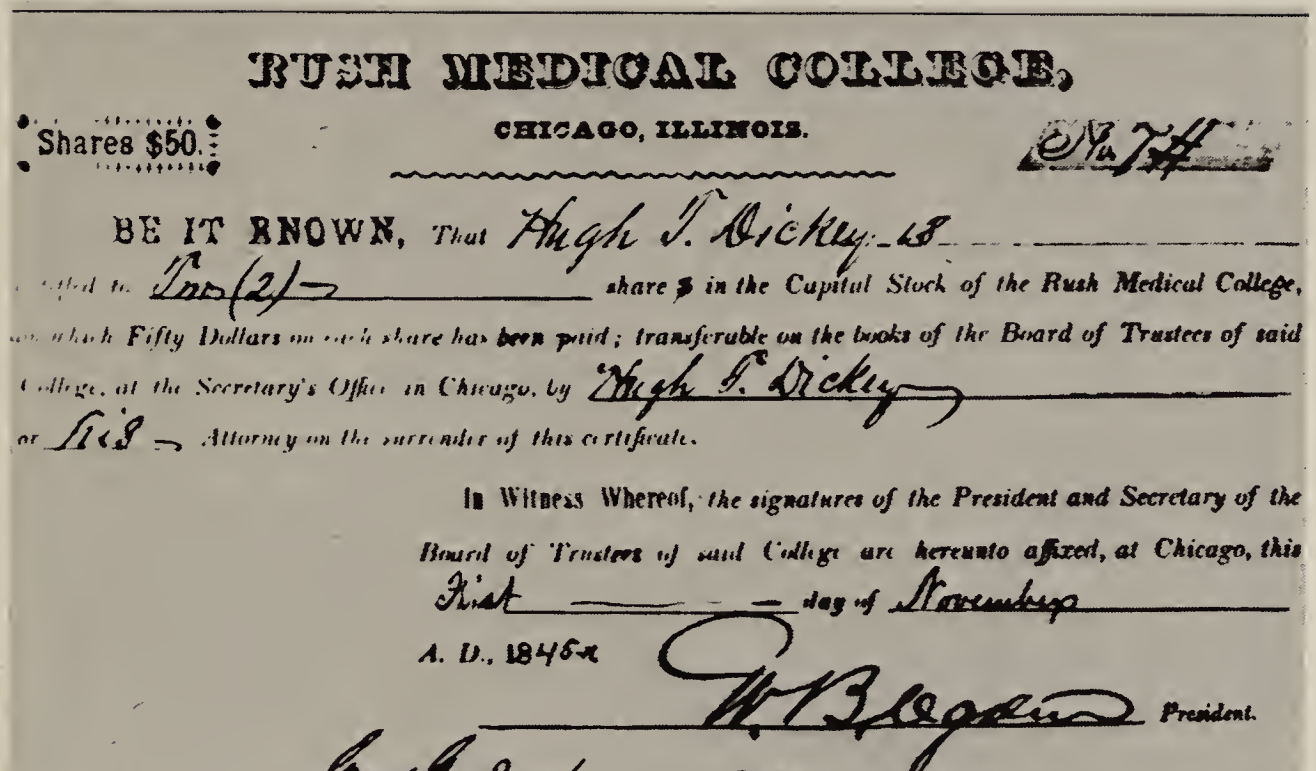
> with it, set to work on the June No., and just at this time my two sisters from St. Louis, coming to town, monopolized so much of my time that I had but little leisure for correspondence.... I would be much obliged to you or Dr. Sager for communications for the journal. Could not one or both of you have one for the next Journal?[20]

And on July 17 Blaney continued his plea for help:

> As regards the Journal, I hope, my dear Doctor, that you will assist me as much as possible. The present number has been most miserably delayed in its issue until today, partly because I waited until I should hear from you, fully expecting that I should have a communication from you. Failing in this, I had to manufacture a long article myself. After I had sent it to press, I was put off by the printers who had a press of business on hand, which, (because it paid better, I suppose) took precedence. I hope that if you have not forwarded an article to me previously to the receipt of this, that you will send it as soon as possible.... I have not a single communication for the next number, and must send it to press in a few days in order to warrant its punctuality.[21]

Throughout the summer there were queries and applications for admission to the medical school. Most of the students came from the farms of Illinois, Indiana, Michigan and Wisconsin, so the course began when the fall farm work had been completed (late November or early December) and terminated after a course of approximately sixteen weeks, when the students were needed at home for spring plowing.

There were few or no requirements for admission to the school. For graduation each student was supposed to have reached the age of twenty-one, be of good moral character, have had three years of study with a preceptor, have attended two courses of lectures, have written a thesis, and have paid the fees. The fees at Rush were $5 for matriculation, $10 for each of six courses, $20 for graduation, and an optional $5 for dissection. Since the matriculation and graduation fees were used for running the school, they had to be paid in cash. The



RUSH MEDICAL COLLEGE,

CHICAGO, ILLINOIS.

Shares $50. No. 74

BE IT KNOWN, That Hugh T. Dickey of

is entitled to Two (2) share s in the Capital Stock of the Rush Medical College, on which Fifty Dollars on each share has been paid; transferable on the books of the Board of Trustees of said College, at the Secretary's Office in Chicago, by Hugh T. Dickey

or his Attorney on the surrender of this certificate.

In Witness Whereof, the signatures of the President and Secretary of the Board of Trustees of said College are hereunto affixed, at Chicago, this First day of November

A. D., 1846.

W. B. Egan President.

Grant Goodrich Secretary.

Fig. 11. Stock certificate of Rush Medical College. (From George H. Weaver, "Beginnings of Medical Education in and near Chicago" in Bulletin of the Society of Medical History of Chicago, *vol. 3, no. 4, page 360, September, 1925.)*

fees for courses were often met by signing notes to be paid later. Tickets were given for each class.

To most of the young men who were starting their first year, Chicago, with its population of 7,500, seemed to be a large and bustling city. If they had no friends or family, they had to seek out a boarding house. Room and board could be obtained for $1.50 to $2.00 per week. A typical student recorded his arrival in Chicago as follows:

> I came from the banks of the Wabash, and there was no communication between Chicago and the Wabash: no railroads, no stage lines; I was compelled to come on horseback; following the trails and camping. When I arrived here I inquired where Dr. Brainard lived and was directed to his house, and I went there and told my story. I told him I was a medical student, come to join his class at Rush Medical College. He did not send me away, but he came out and together we went to a livery stable, and I remember his talk to a livery man. He said: "Here is a young man who wants to enter the college. I want you to sell his horse and give him the money; he is innocent of the world outside." I am always glad he made a correct diagnosis in my case. My horse was sold, and he found me a boarding-place. He took a great interest in me, and was a personal friend to me during the whole time I was in college.[22]

Summer faded into a very cold and inclement autumn which delayed the progress of the building. But the school circular had stated that classes would start the first Monday in November and so they did. Dr. Austin Flint gave the commencement address. In medical schools of those days commencement addresses were given at the beginning of the school year—a custom which does have its logic. Flint's address was entitled "The Reciprocal Duties and Obligations of the Medical Profession and the Public." He concluded with these words of admonition:

> Let the public and the profession mutually recognize, understand and perform their reciprocal

Fig. 12. John M. Van Osdel, architect for Rush Medical College. (By John Corbutt, 1868. Photo courtesy of Chicago Historical Society.)

> duties and obligations; and, for one, I entertain no fear but that the former will derive all the advantages from medical science, which are compatible with the plan and dispensations of providential wisdom; and the latter attain to that position of dignity and honor which is its rightful inheritance.[23]

Through the autumn Mr. Van Osdel was prodded, nails hammered, window panes inserted, skylight adjusted, shelves erected, cabinets juggled into place, laboratories set up, floors swept clean, and finally invitations to the dedication mailed. The *Chicago Democrat* noted that the building was the height of elegance and the peak of efficiency. Most of the citizens and the faculty agreed; however, there were contrasting minority views. Dr. J. Adams Allen, who years later was to become president of Rush, said that the building had always reminded him of a rat trap!

The new building finally was dedicated on Friday, December 18, 1844. It was the week before Christmas and an air of holiday expectancy engulfed the crowd of townspeople and the students with their families and friends. In reporting the event in the January, 1845 issue of his journal, Blaney stated that "the lecture-room upon the first floor was crowded to excess with the sage and the gay." Then he continued his report by abstracting Dr. Brainard's address:

> He spoke first of the history of the school and of its rapid progress, which already permitted its friends to assemble in so fine an edifice. He next proceeded to consider the reasons why institutions of the higher order should be planted in the West; said that it was soon to be the seat of power for the whole northern continent. He then alluded to some popular errors concerning education, and showed that it was more important and difficult to produce a few men who make discoveries and advance the knowledge of mankind, than a much greater number who are incapable of it. He advanced the position that this could only be done by time and cooperation of many persons, and traced the history of some of the

celebrated colleges of Europe, to show the successive degrees by which they have become perfected.

He then proceeded to show the manner in which they should be conducted in this country—that they should be regarded as instituted exclusively for the public good, and not for the benefit of individuals, and assured his hearers "that this edifice, which had been erected by their liberality, should be forever sacred to the cause of science and humanity." He then traced the plans for its future improvement; for the formation of a library; of a museum, and the establishment of a hospital, which should place it on a level with the first institutions in the country.

He next addressed himself to the pupils, congratulated them upon the prospects opening before them in the West, urged them to prepare themselves for the first places in the profession, assuring them that their destinies in life would be greatly influenced by their present plans and aspirations.

> The discourse concluded with congratulations to the friends of the institution on its success and prospects, and thanks for their liberality; and with the assurance that whatever obstacles threatened to obstruct its progress they would be overcome; that its Faculty would be devoted to it, to the degree necessary to ensure its prosperity.[24]

So eight years after its charter was obtained, Rush Medical College faced the new year of 1845, established in its own building, surrounded by a loyal community, with an able faculty and eager students.

Notes

1. Thomas Neville Bonner, *Medicine in Chicago, 1850-1950: A Chapter in the Social and Scientific Development of a City* (Madison, Wisconsin: The American History Research Center, 1957), 5.

2. Howard A. Kelly, *A Cyclopedia of American Medical Biography, Comprising the Lives of Eminent Deceased Physicians and Surgeons From 1610 to 1910* (Philadelphia: W. B. Saunders Co., 1912), 2:132.

3. George H. Weaver, "Beginnings of Medical Education In and Near Chicago: The Institutions and the Men," *Bulletin of the Society of Medical History of Chicago 3* (September 1925), 386.

4. *Ibid.*, 345.

5. *Ibid.*, 430.

6. *Ibid.*, 412.

7. *Ibid.*, 357.

8. *Ibid.*, 431.

9. Austin Flint, *The Reciprocal Duties and Obligations of the Medical Profession and the Public: A Public Introductory Lecture Delivered at the Rush Medical College at the Commencement of the Session 1844-5* (Chicago: Z. Eastman, Printer, 1844), 3.

10. Weaver, "Beginnings of Medical Education," note 21, 360.

11. *Ibid.*, 435.

12. *Ibid.*, 437.

13. *Ibid.*, 400.

14. *Ibid.*, 404.

15. *Ibid.*, 398.

16. *Ibid.*, 358-359.

17. *Ibid.*, 434.

18. *Ibid.*, 437.

19. "Introductory." *Illinois Medical and Surgical Journal 1* (April 1844):1-3.

20. Weaver, "Beginnings of Medical Education," 433-434.

21. *Ibid.*, 437.

22. E. T. Spotswood, Talk given at Rush Medical College in June, 1912, the centennial celebration of Brainard's birth. Published in *Rush Alumni Association Bulletin 9* (July 1912):32.

23. Flint, *Reciprocal Duties and Obligations*, 24.

24. "Dedication of the Edifice of the Rush Medical College," *Illinois Medical and Surgical Journal 1* (January 1845) 160.

Chapter V
Growing Pains and Pleasures

After the tumult and the excitement of the first school year in the new building, the whole faculty took a deep breath. Then they turned their attention to their neglected private lives. The week after graduation on Thursday, February 5, 1845, Daniel Brainard married Evelyn Sleight, the twenty-year-old daughter of Colonel Sleight of Naperville, Illinois. The timing was prophetic. For the rest of her married life, Evelyn Brainard adjusted to the double burden of a surgeon's schedule and the calendar of a medical school. James Blaney wrote John McLean regarding the news of the wedding and added that the newly married couple were living at a "private boarding" because their house was not yet finished.[1] Finally in October, just before the fall term started, they were happily settled in their new home. A new occupant for this home, their daughter Julia, arrived on December 4, 1845.[2]

The two medical students who lived in the room behind Brainard's office and helped with the animal experiments were delighted. They noted that since Dr. Brainard was now sleeping double, they could store the rattlesnakes used in the snake venom experiments in a large box under his now vacant bed at the office.[3]

In March the McLeans had a baby boy and Brainard and Blaney acted like doting uncles. During the summer Dr. Herrick built his house across the street from the school. The next year, when Blaney was married, he and his wife boarded with

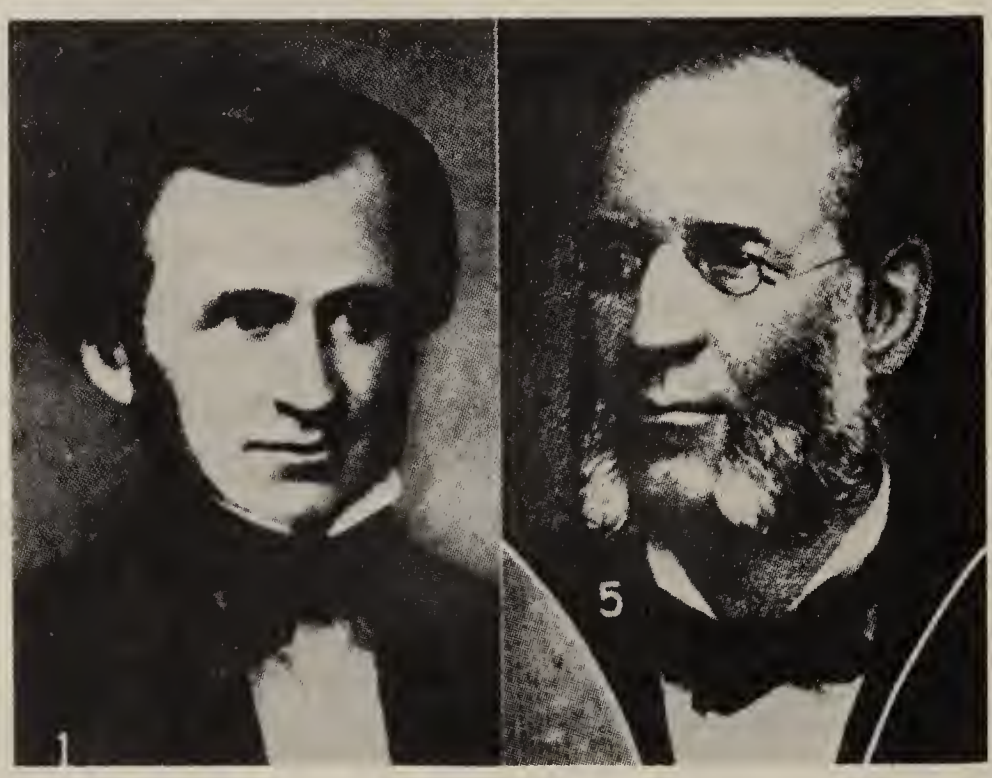


Fig. 13. Faculty of Rush Medical College, 1844-1845. Top row, left to right: Brainard, Blaney, McLean. Bottom row, left to right: Herrick, Flint. (From George H. Weaver, "Beginnings of Medical Education in and near Chicago" in Bulletin of the Society of Medical History of Chicago, *vol. 3, no. 4, page 360, September, 1925.)*

the Herricks until their home was completed.

By the first Monday in November of 1845, this closely knit faculty was ready to go back to the school routine. Blaney wrote that he had gone to the trouble and expense of fixing up his own mineralogical cabinet and a *materia medica* cabinet for Dr. McLean and he hoped that the graduation and matriculation fees would cover the expenses. Then he added, "I have been rigging up an apparatus to heat the upper lecture room by hot air."[4]

That fall the school enrollment had doubled to fifty students, but the population of Chicago was increasing at an even more rapid rate—from 4,470 in the census of 1840 to 30,000 in 1850. In the history of Chicago such increases correlated closely with increases in means of transportation. The opening of the Illinois-Michigan Canal in 1848 made Chicago a pivotal city in east-west traffic. This event was a personal victory for Brainard. Having been raised in upstate New York, the building of the Erie Canal had been an important event in Brainard's childhood and he recalled that at the age of five, on Independence Day, 1817, he had driven with his father to nearby Rome, New York, where amid much fanfare and fireworks, the first ground was broken for the new canal. Eight years later he had seen the first boat, *The Seneca Chief*, pass through with Governor Clinton and other dignitaries on board. The ship had carried two red, white and blue barrels of Lake Erie water which was to be mixed with the salt water of the ocean at New York.[5]

When Brainard came to Chicago, he became a strong supporter of the Illinois-Michigan Canal because he had realized what the Erie Canal had done for the development of New York State and the growth of New York City as a leading port in world trade. He gathered statistics on the trade that could be carried on the Illinois canal. This material formed the basis of his editorials in the *Chicago Democrat* and of his talks with businessmen whose support he wanted to gain for the project. The introduction of plank roads in 1850 helped to bring produce into Chicago for shipment east. Both of these means of transportation were important in funneling into Chicago the stream of emigrants from Scandinavia, Germany and Ireland. Although many settled in Chicago, others traveled on to Illinois, Indiana, Wisconsin, Minnesota and Iowa.

Because the housing market was not able to keep up with this growth in population, overcrowding naturally resulted. There was no sewage system. Garbage was thrown into whatever was close at hand—the river, the lake, the street, or the alley. Drinking water came from shallow wells and the lake shore. These crowded and unsanitary conditions were factors in the epidemics which swept through the city—influenza in 1843, scarlet fever in 1845, typhoid in 1848, cholera in 1849-50, and smallpox in 1853.

During these years Brainard's practice grew with an increasing number of complicated cases, many referred by other physicians. A large part of his practice dealt with fractures, dislocations and ankylosed joints. Townspeople fell out of carriages, drunks fell from sidewalks, farmers fell from horses and children fell from trees.

Plastic surgery was of special interest to Brainard. He struggled with the repair of cleft palates and burn contractures. A terrible problem of his day was the severe mercurial stomatitis which resulted from overdosage with calomel. This was usually complicated by secondary infection and often resulted in anklyosis of the mandibular joints. The result was a patient who could not open his mouth to take food. By the time these patients sought help, they were in advanced stages of malnutrition. For patients requiring plastic surgery, Brainard spent hours working out the details of the operation and still more hours devising the instruments used in actually performing the operation.

Post partum hemorrhage, prolonged labor and gynecological problems occasioned calls from patients and referrals from general practitioners. In addition to his cases in private practice and in consultation, Brainard opened a free surgical dispensary in 1846. A similar medical dispensary founded by Blaney was already functioning. These two dispensaries were then united as the Rush Dispensary. Several years later the city took over the financial burden, although it was still manned by the Rush faculty.

The following excerpt from an editorial in the *Illinois and Indiana Medical and Surgical Journal* gives a medical viewpoint of this dispensary:

> This noble charity, established by the Faculty of

THE RUSH MEDICAL COLLEGE

ILLINOIS

MEDICAL AND SURGICAL

JOURNAL.

EDITED BY

JAMES V. Z. BLANEY, A. M., M. D.

PROFESSOR OF CHEMISTRY AND PHARMACY IN THE RUSH MEDICAL COLLEGE.

VOLUME I.

CHICAGO, ILL.:
PUBLISHED BY ELLIS & FERGUS,
BOOK AND JOB PRINTERS,
SALOON BUILDINGS.

1844.

Fig. 14. Cover of the Illinois Medical and Surgical Journal, *first issue, 1844. (Photo courtesy of Library of Rush University.)*

Rush Medical College, has been adopted as a county institution by the Commissioners of Cook county, and well may they be proud of an institution which so liberally scatters its blessings amongst the sick poor. There have been over two hundred prescriptions made for more than one hundred patients since the opening of the session of the College, in November.

In addition to the extensive relief afforded the poor sufferers, there has another most important end been attained by it. The prescriptions were made before the medical class—thus teaching the young men how to practice, and affording them an opportunity of witnessing the effects of treatment upon a large variety of diseases. After entering upon the duties of the profession, the students who have witnessed the treatment of these cases, meeting with the diseases, will recognize them as old acquaintances—enemies—with the weapons of warfare against whom they are already familiar, both as to their nature and application—and they go forward in practice with confidence and success.

The following diseases, as shown by the record of the Dispensary, many of which will form interesting reports for the *Journal* when drawn up by the clerk, were presented, and served as illustrations for clinical lectures on practice to the class:

Hypertrophy of the heart; dyspepsia; intermittent fever, with almost all of its complications; enlargement of the spleen; conjunctivitis, acute and chronic; ascitis [sic]; anasarca; chronic pleuritis; neuralgia; dysmenorhoea; gastritis; peritonitis, chronic; hysteria; gastro enteric irritation; scabies; jaundice; bronchitis; erysipelas, influence, &c.

And the following were presented illustrating the surgical clinic—Enlarged tonsils; old laxation of elbow joint; indolent ulcers; abscesses; nasal polypi; caries of bones and polypus of the ear; strabismus; ulceration of stump of amputated leg; necrosis; hernia; fractures, of metacarpal bones and of neck of the femur; incised wound of knee; encysted tumor;

morbus coxarius, with many others of less importance.

These required the following operations, which were successfully performed by Prof. Brainard before the class—Amputations; removal of three carious metatarsal bones, done while the patient was under the influence of the sulphuric ether from inhaling its vapor, patient suffering but little pain; operation for strabismus; removal of tonsils; reduction of old laxation of elbow joint; removal of nasal polypi, of polypi from the ear; application of truss; extirpating tumors; operation for fistula in ano, &c. &c.

Ample trial was made of many of the new remedies and modes of treatment recommended by the profession. And it is a pleasing consideration, that while most of the patients have been discharged cured, not one has died.[6]

Perhaps the following note from Dr. J. Knowles, a former student, reflects more vividly the feeling of this clinic than does the lengthy editorial description.

> [Dr. Brainard] has always been my ideal of a surgeon and a teacher. I have seen him do some very ticklish operations for those days, and I have sat or stood watching, and seen him cut and feel his way and cut again, his lips compressed and his face set until I have caught myself comparing it to a piece of sculptured granite and wondering if he had any sense of feeling for his patient. But one day a little girl about 10 years old came into his clinic unattended and said she wanted her leg broken over and made straight so her schoolfellows would not call her "Limpy." The professor examined the limb and found that there had been a compound comminuted fracture of both bones just above the ankle. He told the class that "No matter whether an accomplished surgeon or an old 'Granny' had done that work it was well done under the circumstances." When the little one realized that she must remain a cripple she cried

> as though her heart would break. Brainard took her up in his arms and stroking her hair told her to go to school and grow up with a well stored symmetrical mind and the day would come when folks would forget that she had a deformed limb in their admiration for her pluck and accomplishments. And as she lay sobbing on his shoulder the grand old man forgot himself enough to let great big drops run from his eyes and fall to the floor. Then I realized how much of real solid humanity there was in him.[7]

As Brainard's practice increased in complexity and the city grew in population, the need for a hospital became ever more urgent. In 1847 the first attempt was made to start a hospital. Brainard rented rooms in the Lake House building at the corner of North Water and Rush Streets, and bought twelve beds. As soon as the beds were set up, patients filled them, thus leading to the obvious problem of who was to take care of the occupants. A landlady in the building agreed to take care of the "domestic needs" of the patients for $2.50 a week. Rush medical students gave nursing care. This arrangement was not the Philadelphia General Hospital, and it certainly was not the Hotel Dieu, but it was better than nothing. While this makeshift hospital staggered along on its erratic course, solutions were being sought but were not realized for several years.

Notes

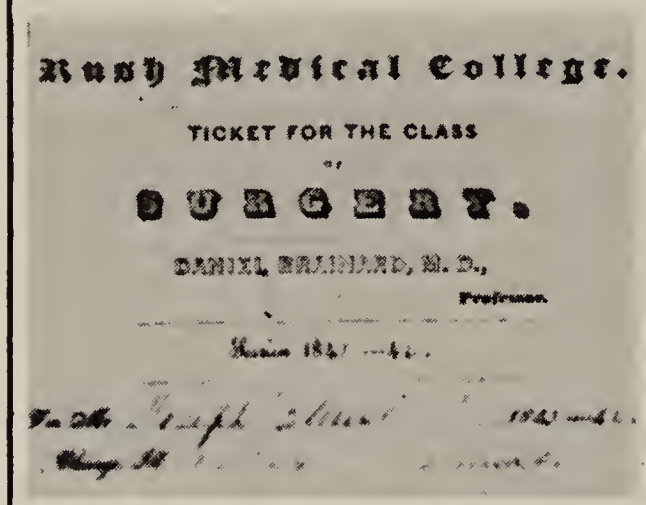
1. George H. Weaver, "Beginnings of Medical Education In and Near Chicago: The Institutions and the Men," *Bulletin of the Society of Medical History of Chicago 3* (September 1925):440.
2. From the inscription on the Brainard monument in Graceland Cemetery, Chicago.
3. Undated letter from E. A. Guilbert to Professor Ingals at Rush Medical College.
4. Weaver, "Beginnings of Medical Education," 444.
5. John Behuniak, "Erie Canal," *Christian Science Monitor*, May 6, 1985, B3.
6. "College Dispensary," *Illinois and Indiana Medical and Surgical Journal 1* (February 1847):549-550.
7. Letter from J. Knowles dated December 3, 1898, to Dr. J. H. Etheridge in Logan, Iowa.

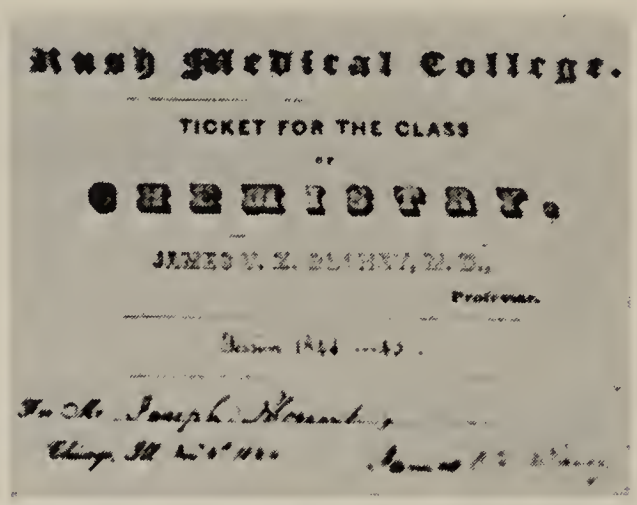
Chapter VI
A Changing World

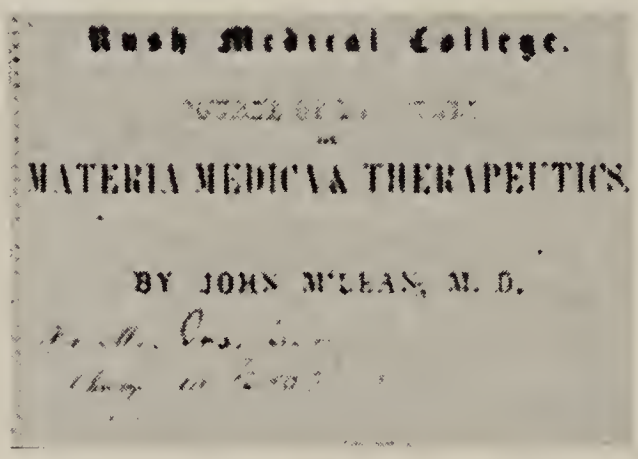
Meanwhile, as Rush and its physicians and students were changing, so was the science of surgery. On October 16, 1846 William Morton administered ether anesthesia for an operation performed by John Collins Warren at Massachusetts General Hospital. This event initiated the first of two great revolutions that were to change the practice of surgery in the nineteenth century. A month later Henry Bigelow described the event in the November 18 issue of the *Boston Medical and Surgical Journal*.[1] Brainard received this journal and read the article with tremendous excitement. He dashed into the chemistry laboratory to talk with Blaney. At that time Blaney was working with chloroform, a substance which had been produced chemically by Justus von Liebig, Samuel Guthrie and Eugene Soubeiran in independent research, but had not yet been studied for its potential as an anesthetic.

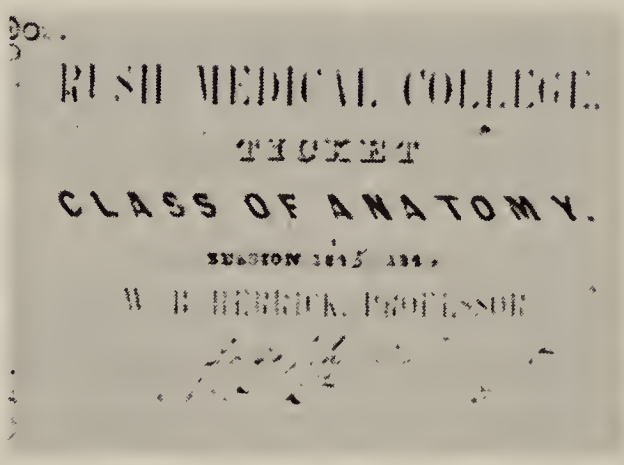
Blaney put aside his experiments with chloroform and worked on the production of sulfuric ether as described in Bigelow's article. Brainard had the druggist order the suggested inhaler. He also contacted Charles Henry Quinlan, a dentist, to see if he would be willing to give the anesthetic. Brainard did not want to use the anesthetic unless the patient asked for relief of pain. He did not have to wait long. On January 12, 1847 a young man came to the dispensary for the amputation of the end of his middle finger. In Brainard's words:

> Being very timid, he wished something to prevent the pain, and the ethereal vapor was administered to him for about five minutes, in a moderately









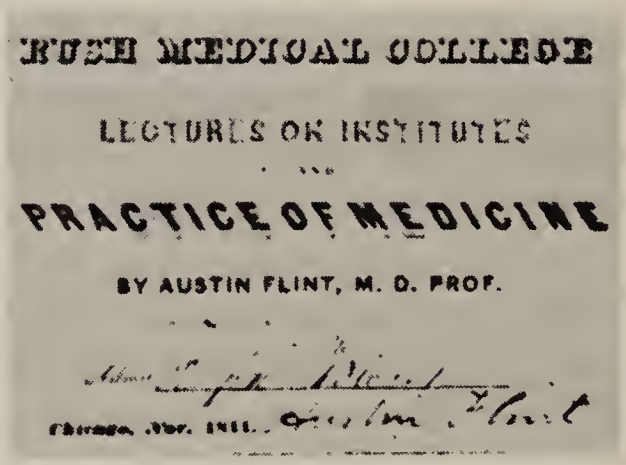


Fig. 15. Student class tickets, 1844-1845, belonging to Brainard, Blaney, McLean, Herrick, Flint. (Photo courtesy of Rush-Presbyterian-St. Luke's Medical Center Archives.)

> concentrated form, when he became insensible. . . . He remained asleep a minute after the operation was finished, and on awakening and perceiving that it was done he smiled, and said, "that was pretty easy." No ill effects followed.[2]

Several weeks later a friend of the first patient came in and wished to have his foot repaired and requested anesthesia; Brainard again agreed. Once in surgery, however, it became evident that the lesion was much more extensive than had been thought, and the operation required twenty-five minutes. The patient had hardly any recollection of pain and did well. But Brainard was in a cold sweat at the length of time he had had the patient under anesthesia.

He and Blaney took the anesthetic over to the laboratory behind the office and selected a large dog. Brainard described their experimentation thusly: "(The dog) was made to inhale the vapor in a concentrated form for eight minutes. After a few inhalations he became insensible, struggled feebly from time to time, and remained in a state of relaxation for a few seconds with his head hanging over the table when he recovered completely."[3] Brainard was somewhat reassured, although he and Blaney peered at the dog every morning for a week. When Brainard wrote up these cases, he made the point that more studies were needed to ascertain the effects of prolonged anesthesia. He cautioned against its use "where there is disease of the lungs, tendency to apoplexy, or mania, or an extreme nervous temperament."[4] His conclusion was that anesthesia demanded "the most careful and dispassionate examination of surgeons."[5]

The use of anesthesia widened the field of surgery and lengthened the permissible time period of an operation and in this way changed the practice of surgery and the surgeons themselves. When speed, boldness and incisiveness were necessities, there were surgeons like George McClellan and Valentine Mott. When time was not the essential factor, these qualities were replaced by skill and careful handling of tissues, and surgeons like John Warren, Samuel Gross and Daniel Brainard came into their own.

Surgery was still limited by the danger of introducing or spreading infection. Later in the century Louis Pasteur's

studies of bacterial infection led Joseph Lister to investigate and introduce chemical antiseptic techniques in an attempt to prevent infection. This technique produced the second revolutionary change in surgery.[6] Although these techniques were introduced after Brainard's death, he was by nature a clean and meticulous operator. A firm taskmaster about cleanliness of operating personnel, Brainard was a martinet about instruments. After surgery each instrument had to be cleaned, rinsed, dried and placed back in the instrument case. (In the student reports from surgery clinic one can detect some impatience with this time-consuming meticulousness.)

Sir Clifford Allbutt (1836-1925), whose long life spanned this time, summarized the impact of anesthesia on the medical profession:

> When I was a boy, surgeons operating upon the quick were pitted one against the other like runners on time. He was the best surgeon, both for patient and onlooker, who broke the three-minutes record in an amputation or a lithotomy. What place could there be in record-breaking operations for the fiddle-faddle of antiseptic precautions? The obvious boon of immunity from pain, precious as it was, when we look beyond the individual, was less than the boon of time. With anesthetics ended slapdash surgery; anesthesia gave time for the theories of Pasteur and Lister to be adopted [into] practice.[7]

The lessons of practice and the discipline of teaching were reflected in Brainard's medical writing. Firmly imbued at Fairfield Medical School with the importance of reporting cases, his first observations were sent in a case report on amputation at the hip joint to the *American Journal of the Medical Sciences* (Philadelphia) followed by a modest letter on the character of fevers to the editor of the *Medical Examiner* (Philadelphia).

While studying in Paris, Brainard encountered a more sophisticated level of practice and also of medical writing. He had opportunities to hear a wide variety of lectures, to read French medical journals, to hear discussion at medical meetings and to read books that French surgeons were

publishing. He gained in knowledge but he also learned to write so as to convey that knowledge. The articles that Brainard wrote after returning from Paris show an increasing scientific maturity.

Within the year of opening Rush Medical School, Brainard had persuaded James Blaney to start publishing the *Illinois Medical and Surgical Journal.* In spite of a busy schedule Brainard managed to write an article for nearly every issue. Although many of these were individual case reports, there were also articles that dealt with wider medical or surgical issues. These articles contained a statement of the problem, a review of the literature, a discussion of previous ways of handling the problem, a presentation of his solution and results, and when possible, a statistical evaluation of results which showed the influence of P. C. A. Louis on surgeons as well as internists. His surgical clerks were introduced to medical writing through the reporting of their cases from the surgical clinics. Brainard also reviewed surgical books and atlases, books by French authors and books on medico-legal problems.

As each year went by, the improvement in Brainard's clinical judgment was reflected in the care with which he stressed the indications and contraindications for any method of treatment or procedure. This conscientiousness was unusual in the literature of his day (or our day)—in which any new procedure or medication was apt to be blown up to a panacea for every ill.

Another innovation Brainard made was in the use of sketches and diagrams. A small sketch of ectropion, proudly marked "wood cut," shows his enjoyment of illustration.[8]

The steady growth of the medical school was accompanied by changes in the faculty. Austin Flint did not return after his first year. Living in Buffalo, Flint could not afford to spend twelve weeks teaching in a school where many of the students signed notes for their fees but never managed to pay them. This loss necessitated shifting Dr. Fitch from obstetrics to medicine.

The vacancy in obstetrics was filled by John Evans of Attica, Indiana. Although during the first year, 1845, Evans came only for the period of the school term, by 1847 he had decided to move to Chicago. Evans had also been made editor of the journal since Blaney had grown tired of the position. Evans was born in Waynesville, Ohio, on March 9, 1814. While in

preparatory school he had become interested in medicine and had written to his father: "Oh I am reading physiology the most delightful stuff that I have found but all the books are more and more interesting even the latin lesson is delightful." He ended the letter with the plea: "If it is convenient thow mayst say whether thee can consent to my wish to study (medicine) or not, and please do not send me back into the old store to loll on the counter. O, I cannot do it unless I have to, but thy word is sovereign and I hope to be dutiful. Thy affectionate and grateful son, John Evans."[9]

Having overcome his father's objections, Evans went to Cincinnati Medical College and completed his course in 1835. Upon graduation his father gave him ten dollars and a pony with a saddle and bridle. Thus outfitted, he rode west to find a place to practice. He finally settled in Attica, Indiana, where he built up a large practice.

Evans was a person who needed a cause in his life. The cause he now undertook was better care for the insane. To Evans, a cause led immediately to action. He persuaded the state legislature to pass a bill providing for the building of a state insane asylum. Next he managed to be selected to design and erect the building. When it became a question of accepting the position of superintendent of the asylum, Evans decided his real interest was in medical education. Consequently, Rush Medical College became his new cause. Although the faculty was united in trying to make Rush the best medical school, Evans was devoted to the idea that it should be both the largest and the best.

To quiet, studious, retiring John McLean, who had been with Rush since its inception, Evans wrote on June 21, 1847:

> Now, Doctor, I tell you what it is, you must be up and doing. We must have 150 students this winter or break a trace and at least 25 of them must come from Michigan. Now, if you do not know where they are to be found it is time you were looking them up. I will take 25 and Fitch 20 from this state and the other 75 must come from Mo., Wisconsin, Iowa and elsewhere.
>
> You would better, I think, operate in the Southwest part of your state. . . .
>
> I am going to make the strongest effort I ever did

> and want all others to do it too. . . .
>
> Some three or four weeks spent now traveling on a Botanical tour, gathering specimens, etc., etc., will be the best way of extending your reputation for science, making acquaintances with physicians, finding students and extending the circulation of the Journal. If we do not work, neither shall we eat. I am going to pursue a similar course. What say you?[10]

In another letter to McLean, Evans admonished further: "Doctor, you must see that the character, usefulness and success of our school must depend upon the reputation of its teachers. Then it becomes important for each of us, not only to teach well and profoundly, but to write well and extensively. This while it enriches our Journal, extends the reputation of the school."[11]

There were times when everyone wished that it were possible to take John Evans in homeopathic dosage. But he was appealing in his enthusiasm, engaging in his interest in people, steadfast in his ideals, and breathtaking in his energy.

Initially Brainard went along with Evans's recruitment policies, but in 1855 there was a revealing comment in his address to the students. Remarking on the exceptionally large class of 1847-48, he noted that "the practice of drumming up students and enticing young men into medical colleges from the plough and mechanical pursuits has in this vicinity been discontinued."[12]

In 1849 Brainard was looking for a professor of physiology, a subject which was going to be added to the curriculum. He had been interested in what he had heard and read about Nathan Smith Davis, a young upstate New Yorker who had graduated from Fairfield, practiced in Binghamton and then moved to New York City, where he became associated with the New York College of Physicians and Surgeons, and edited their journal, *The Annalist.*

Davis was interested in the reform of medical education and, to help achieve this goal, in the formation of a national medical association. He was convinced that an association would be instrumental in furthering these needed reforms. When Evans went East for a medical meeting in Boston, he was instructed by Brainard to approach Davis to see if he would be interested

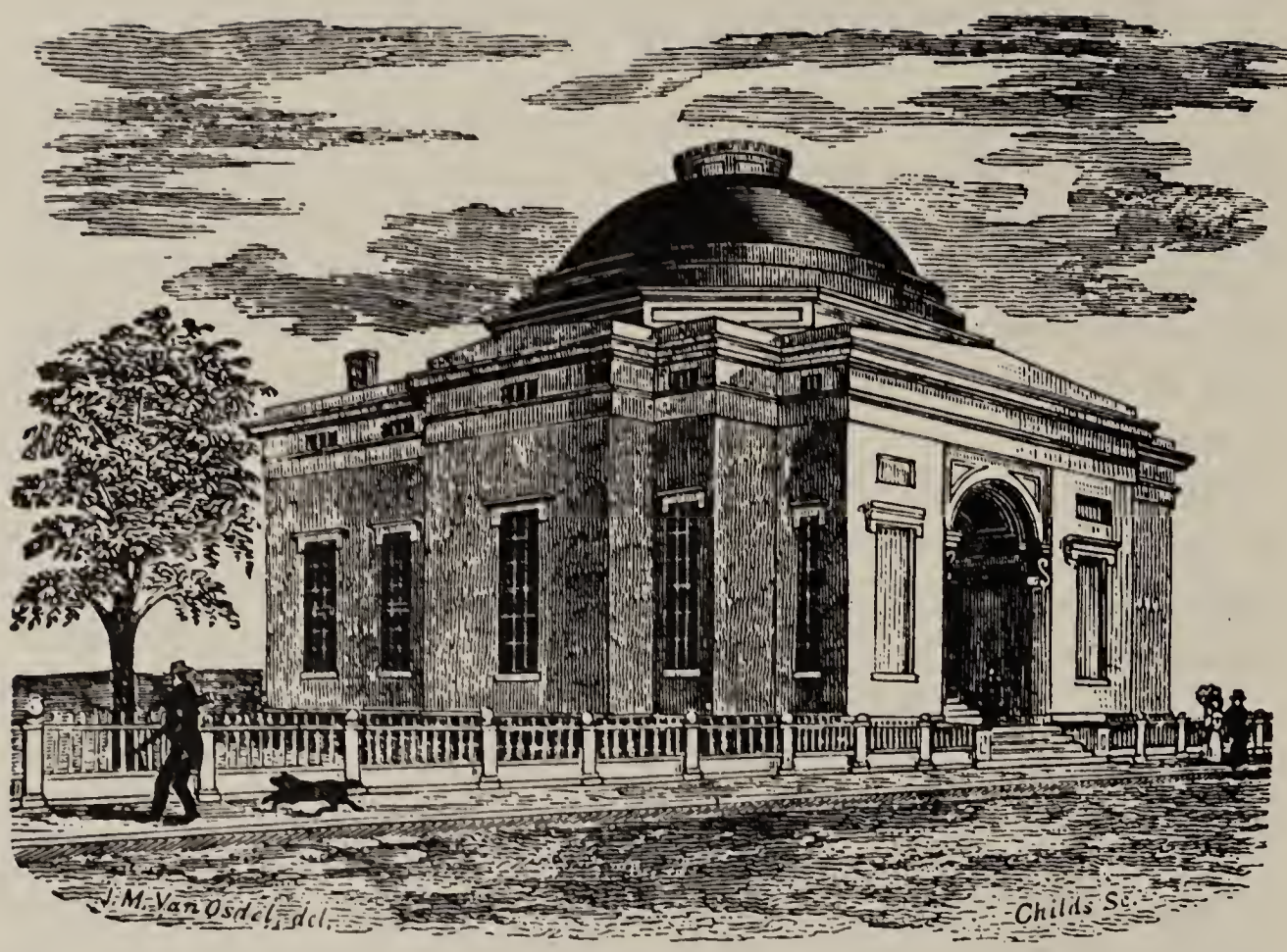


Fig. 16. Rush Medical College of 1844. (Photo courtesy of Rush-Presbyterian-St. Luke's Medical Center Archives.)

in coming to Chicago. Davis was intrigued with the idea of moving West. He was not unhappy in New York City but he was an outsider, and in his view he was making progress slowly. He was willing to come as professor of physiology but he wanted to become the professor of medicine when that chair became available. His other request was that when he became professor of medicine he was to have a "real" hospital. Under Brainard's direction, the trustees agreed to these conditions to Davis' hire. Davis and his wife and two children came to Chicago before the fall term, and he gave the commencement address at the opening of school.

A change in location had made no change in Nathan Davis's crusade for reform in medical education. And certainly reform was needed. The old system of apprenticeship—followed occasionally but not necessarily by medical school, approval of training by a medical society, and then state licensure—was falling apart. This system had always been honored more in theory than in practice. Apprenticeships gradually were being replaced by medical school attendance. To the five established schools at the turn of the century had been added a plethora of new schools. Now medical schools offered as varied a range of learning experiences as apprenticeships formerly had. Institutions ranged from the University of Pennsylvania Medical School with 600 students to the LaPorte College of Medicine in Indiana with 12. Some of the new country schools offered no experience with patients either in dispensary, clinic or hospital. Most of the schools awarded diplomas to the student after the completion of two identical terms of varying length (twelve to sixteen weeks).

In general the state or local medical society had the authority to approve either the preceptorship or the school diploma. But certain of the schools, such as Harvard, did not feel that their diploma needed the approval of a medical society. Some states and local societies felt very strongly about the necessity of their approval as a means of controlling the schools. On the other hand, some states and most of the territories had no official medical societies. State laws on licensure thus were in a period of flux. Some new states had no laws on the matter; some old states that had required medical society approval were changing their laws because of pressure from other groups such as homeopathic and eclectic physicians.

Most agreed that apprenticeship had seen its day and that medical education should be pursued in schools, but there were questions: Who would get this education? Of what would it consist? How long would it take to get it? Who would pay for it?

These matters were deliberated from Vermont to Louisiana and from New York to California. To the first question, "Who would get it," the answers varied from an elite few to a Jacksonian "whoever wanted it." The elitest of the elite wanted a college degree as an entrance requirement. Their opponents were the free entry group. Some small schools required only a warm body. It was not until 1880 that the equivalent of a high school diploma was mandated.

There was similar disagreement about what should be taught. The average school taught anatomy and surgery, chemistry (more or less—mostly less), *materia medica*, medicine and obstetrics with gynecology in one term. This term was repeated each year, and attendance at two terms was required for a diploma. As the Philadelphians said, this program was suitable because it "was the way they had always done it." Many of the borderline schools had difficulty in fulfilling even this schedule. Finding anyone to teach chemistry or physiology was a problem. Anatomy often was taught by demonstration with no dissection.

Length of term also was debated. Most schools taught a twelve-week program; some preceded or followed the regular term by a voluntary month. Many schools wanted to incorporate the voluntary month into a schedule of sixteen weeks. The "country schools" had the most acute problem regarding the length of term because they had always started their fall term when the harvest had been completed and ended the term when spring plowing started. A longer term resulted in a melting away of the student body like a snow drift in the spring.

Who would pay for this education? The average fee was ten dollars a subject, with an entrance fee and a graduation fee of approximately twenty dollars each. This figure came to a total of sixty to seventy dollars a year. Schools cut fees during depression years and at other times to gain more students. The only free school was Michigan, which was a state-supported school. As might be expected, the bitterest arguments were about money.

It was soon obvious that the schools' faculties would never agree among themselves and eventually the fight was carried to the newly formed national medical association. At Rush Nathan Davis favored high admission standards, a sequential curriculum, lower fees, and state support. Some of these opinions were more theoretical than practical. For example, higher admission standards were desirable, but since there was little higher education in the Midwest section compared to the Eastern seaboard, the majority of the applicants would have been eliminated. Consequently, the very students for whom Davis wanted lower fees would have failed to meet the entrance requirements. A sequential curriculum was logical if there were instructors to teach it, but many schools were struggling to find instructors for even the basic courses.

Daniel Brainard was far less vocal since he had been through the experience of founding a school. Although he would have liked higher admission standards, he was willing to settle for the best qualified young men that he could select. He was more interested in obtaining good teachers than in proposing a curriculum without qualified teachers. Essentially what Brainard wanted was Fairfield with a French flair—more clinics, dispensaries, hospital rounds and better laboratories. Although he was impressed at first with the idea of state support of medical education, he became more doubtful as he watched the experiences of the Michigan medical school. However, a rather large number of Michigan-trained men became Rush staff members.

In contrast to these hotly debated national policy changes, there were certain local changes taking place in the composition of the student body at Rush. The first black student, David J. Peck from Pennsylvania, was admitted in 1846 and graduated in 1847. His preceptor was Dr. Charles V. Dyer, the most ardent abolitionist in Chicago and a station chief in the underground railroad. This admission led to considerable adverse publicity. Rush was called a "nigger"[13] school by some, but the entire faculty had backed the decision to accept Peck.

In 1852 Emily Blackwell applied for admission. She was the sister of Elizabeth Blackwell, who was the first woman to be admitted to a medical school in the United States. Emily was accepted to the first-year class over the initial protests of a

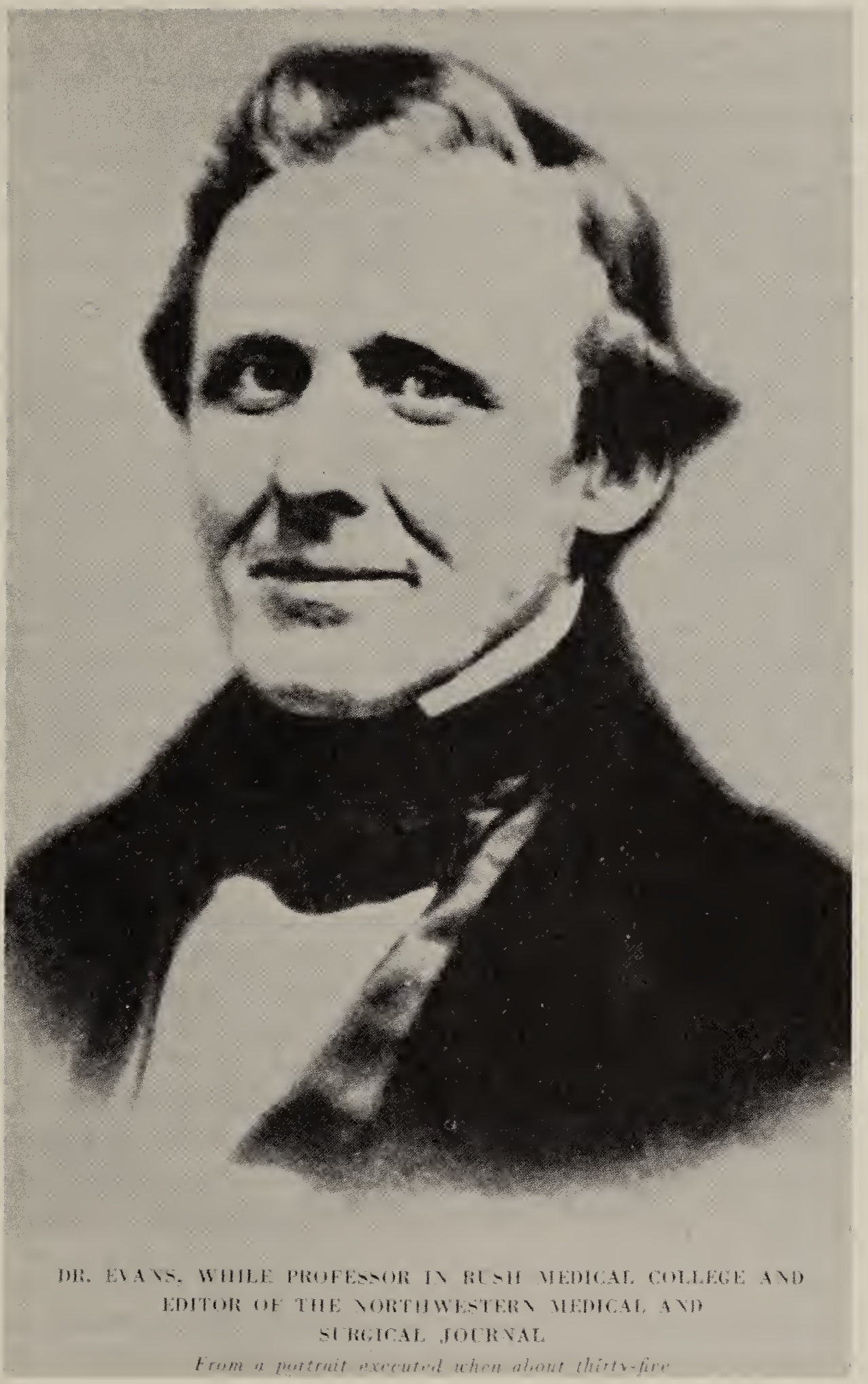
number of students. The protests subsided when Emily proved to be a good student. The following spring, however, Rush Medical School was censured by the state medical society for admitting a woman. The board of trustees and the faculty capitulated and did not allow Emily to return for her second year.[14]

As a faculty member, Nathan Davis proved to be conscientious and hard-working. Within a month the students had nicknamed him the "Prophet" because of his Messianic crusade for reform in education and his sermons against alcohol and alcoholism. One of the sermons was given to the medical students on Christmas Day of 1855, followed by a Christmas dinner (plum pudding without brandy) for all the students who had been unable to go home.

In 1852 and again in 1853 the students voted Davis their favorite teacher. In his second year at Rush his wish to become the professor of medicine was fulfilled. Furthermore as a result of united efforts of the Rush faculty and the citizens of Chicago, there was also a "real" hospital, the second of Davis's conditions for accepting the appointment. The hospital that had been started in old Lake House had languished, but there had been several developments that were encouraging.

As fortune would have it, in 1849 a contingent of the Sisters of Mercy had come to Chicago, prepared to staff a Catholic school. They built their convent just south of St. Mary's Church and just north of the Brainard home. Backyard chats over the low fence that separated their properties had led to the sisters and the Brainards becoming fast friends. With added pressure from Bishop Van de Velde, Dr. John Evans, and Dr. John E. McGirr (who graduated from Rush in 1850 and whose sister was a nun in the order), the sisters were persuaded to change their mission from teaching to nursing.

The Rush faculty and prominent citizens of the city met to devise ways and means of procuring a hospital. A committee was formed of Judge T. Lyle Dickey, Judge Martin Skinner, Captain R. K. Swift and Dr. Evans to collect subscriptions. Captain Swift and Judge Dickey each gave ten dollars and Dr. Evans gave five dollars. Dr. Davis gave a series of six public lectures on the "Sanitary Conditions of the City," burrowing deeper into the mud and filth with each talk. The series was held at the South Market Hall, the largest auditorium in the



DR. EVANS, WHILE PROFESSOR IN RUSH MEDICAL COLLEGE AND EDITOR OF THE NORTHWESTERN MEDICAL AND SURGICAL JOURNAL

From a portrait executed when about thirty-five

Fig. 17. John Evans (1814-1897). (From Life of Governor Evans, *by Edgar Carlisle McMechen, 1924. Photo courtesy of Library of Rush University.)*

city. The tickets were twenty-five cents and two hundred dollars was collected.

Finally, with the consent of Bishop Van der Velde, four Sisters of Mercy left the motherhouse on February 22, 1851, to take care of the patients at the Lake House, now called the Illinois General Hospital of the Lakes. Although the sisters were able to increase the beds from twelve to twenty-four, they needed still more space because they could not admit all who applied for care. By June 21, 1851, the sisters had obtained a charter and the name of the institution was changed to Mercy Hospital. At the end of two years their lease expired and the hospital was forced to move. The only place available was a rickety old building called Tippecanoe Hall at Kinzie and North State Street, where they moved in May, 1853. Fortunately by August their new hospital at Wabash and Van Buren had been completed.[15]

Not only were medical services such as dispensaries and hospitals becoming more organized, but medical men themselves were organizing. In the decade of 1840s and 1850s there was a proliferation (like the swarming of bees) of city, regional, state and national medical societies. This situation had resulted from the fact that there were now more physicians, more professionalization, more transportation and more competition from grandmothers and sectarians to homeopaths and herb doctors.

Daniel Brainard was not a joiner because he felt that most organizations tended to be "Trades-Unions" in their concern for fee standards, or "punitive leagues" in their desire to enforce professional ethics, rather than scientific societies.[16] But when Josiah Goodhue, his best friend who had moved to Rockford, invited him to come to an organization meeting for the Rock River Medical Society on May 14, 1846, he accepted happily. There were twenty-seven physicians from northern Illinois and southern Wisconsin with Rockford, Freeport, Dixon, Beloit and Geneva among the cities represented. They drew up a constitution, bylaws and a section on ethics. The first rule under ethics read: "It is the duty of every medical practitioner to treat his patients with steadiness, tenderness and humanity, and to make due allowances for that mental weakness which usually accompanies bodily disease."[17] Dues were set at fifty cents, to be paid on the third Tuesday in May, the annual

meeting date. After all the protocol and business were finished, Josiah gave a delightful review of the medical history of the area, and then requested everyone to return at 7:00 p.m. when "Prof. Brainard" would address the members "on the subject of the improvements in surgery, with great credit to himself, and much to the gratification of the members of the Society."[18] Then Daniel went home with Josiah and they talked most of the night.

Road improvements in Illinois made it possible for the Illinois State Medical Society to hold its first meeting in Springfield in 1850. The seven-member Chicago delegation went by stage coach. Professor Herrick of Rush was elected president of the society, and Brainard, Evans and Blaney were all given committee appointments. Nevertheless it still required urging to get physicians to the meetings. In 1852 Evans sounded like a travel agent as he wrote in the *Northwest Medical Journal*:

> Now, friends, why not break loose from your domestic and professional cares and anxieties for a few days, and attend the meeting; visit Jacksonville, one of the most beautiful and pleasant spots in the State; see its numerous State and other public institutions; enjoy its intelligent and generous society; meet your professional brethren from different parts of the State, and extend your acquaintance among them; participate in the deliberations of the Society, and endeavor to improve the profession and yourselves?[19]

In the fall of 1850, Levi Boone, who had tried unsuccessfully to organize a city medical society in 1836, was persuaded by Davis and Herrick to try again. Although at the organizing meeting scientific goals were stressed, the society also was encouraged to enforce proper ethical standards and a more courteous standard of professional relationships. Levi Boone was elected president. Since this was exactly the type of society that bored Brainard to death (or at least to sleep), especially if he was not the president, he did not attend any more meetings.

In contrast, Brainard was conscientious in his attendance at the annual meetings of the National Medical Association. From

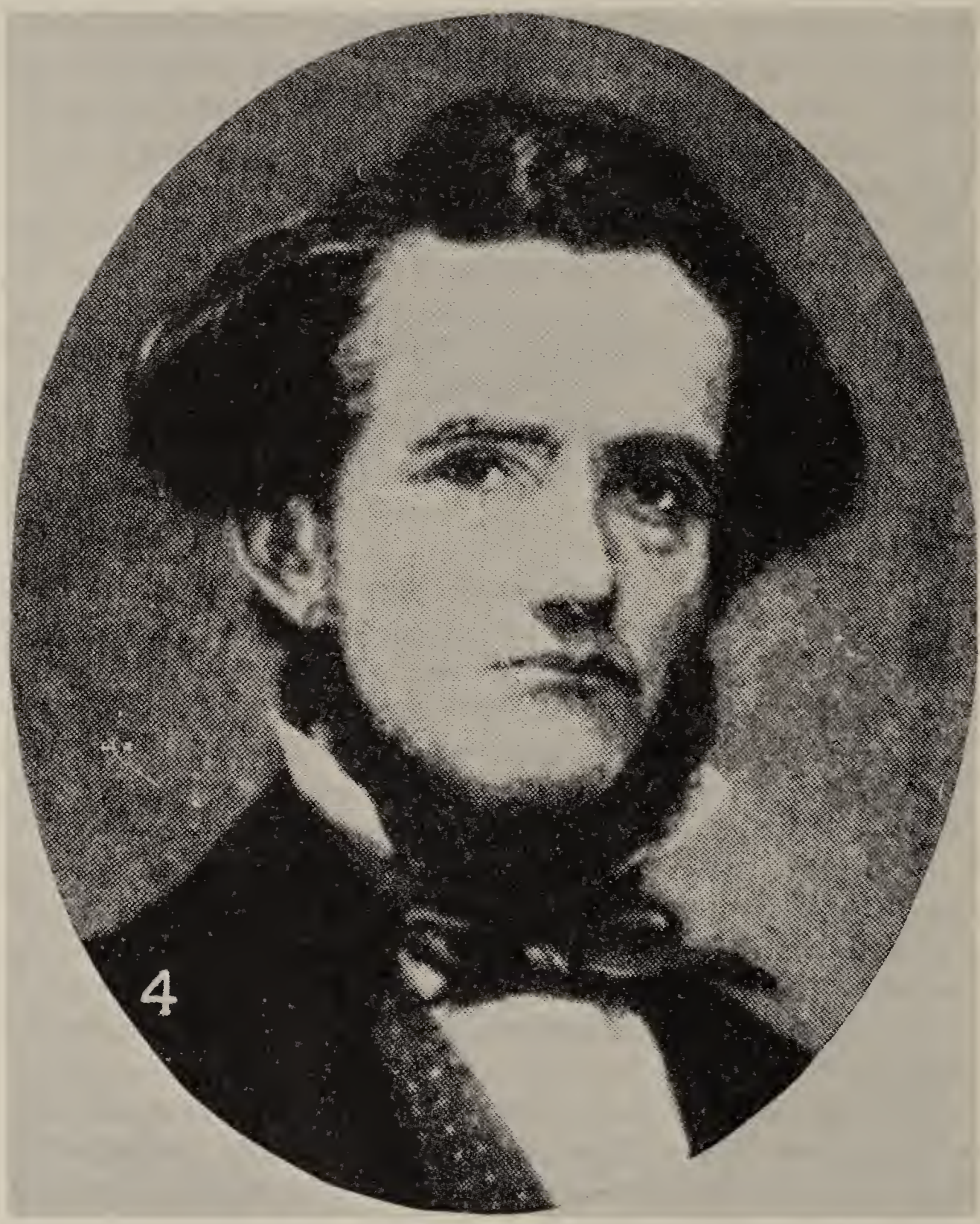


Fig. 18. Nathan Smith Davis (1817-1904). (From George H. Weaver, "Beginnings of Medical Education in and near Chicago" in Bulletin of the Society of Medical History of Chicago, *vol. 3, no. 4, page 419, September, 1925.)*

1850 to 1854 he attended each year as a representative of Rush Medical College. In 1853 he was a vice president. In 1855 he attended as a representative of the Illinois State Medical Society, and again in 1856 and 1859. In other years he attended as a member. Brainard took an active part in several of the committees of the surgical section. At these committee meetings preliminary reports could be made on current work, and criticism and advice from fellow surgeons obtained. He gave preliminary reports on his treatment of cancer with iodides and iron lactate, and also on the treatment of snake bite with iodide. In discussing this report, Dr. Joseph McDowell noted that he had always recommended drinking alcohol, an old Indian remedy that he had never known to fail; but, after hearing this report, if he were bitten he would use the Brainard treatment and then get drunk.[20]

Although these were years of professional growth and achievement, they were also years of personal loss for Brainard. In 1847 he lost his closest friend, Josiah Goodhue of Rockford. Josiah had been returning home from a night call when he fell into an uncovered well. He was rescued but had serious internal injuries. Brainard was sent for immediately, and as quickly as he could he packed his surgical instruments and started up the Galena Trail, pushing his horse to its limit, but to no avail. Josiah was dead when he arrived. Although Daniel tried to console the widow, his own loss left him with no comfort to share. The ride back was dark and lonely—lonely because he had always treasured the opportunities to share triumphs and disappointments with Josiah and now there would never be the solace of sharing. His only other friend was James Blaney, but their relationship was that of a leader and loyal follower. There were aspects of Daniel Brainard that James Blaney never knew. After all, a leader must be strong and resolute, but on that ride home he was neither.

Later in the same year that Josiah died Brainard's first son was born. Although he enjoyed his little daughter, the birth of a son and namesake led to plans for the future. Sometimes, driving home from a house call, he caught himself daydreaming about his son's education and career, and letting his horse find the way. Then the dreams of dynasty disappeared when the little boy died of scarlet fever in October of 1848. A second son, Edwin, was born February 4, 1849, and was to live to the age of

sixty. A third son, Robert, was born on October 3, 1853 and died in infancy on February 25, 1854.

Notes

1. Fielding H. Garrison, *An Introduction to the History of Medicine*, 3rd ed. (Philadelphia: W. B. Saunders Company, 1924), 541.
2. Daniel Brainard, "On the Inhalation of Etherial Vapor for the Prevention of Pain During Surgical Operations," *Illinois and Indiana Medical and Surgical Journal 1* (February 1847):547.
3. *Ibid.*, 548.
4. *Ibid.*
5. *Ibid.*, 549.
6. Garrison, *History of Medicine*, 633-636.
7. *Ibid.*, 542, footnote 1.
8. Daniel Brainard, "Plastic Operation for Ectropion," *American Journal of the Medical Sciences 10* (October 1845):356-357.
9. George H. Weaver, "Beginnings of Medical Education In and Near Chicago: The Institutions and the Men," *Bulletin of the Society of Medical History of Chicago 3* (September 1925):428-429.
10. *Ibid.*, 449.
11. Edgar Carlisle McMechen, *Life of Governor Evans, Second Territorial Governor of Colorado* (Denver: the Wahlgreen Publishing Co., 1924), 49.
12. Daniel Brainard, "Introductory Lecture, at the Opening of the Thirteenth Annual Session of Rush Medical College, Nov. 5th, 1853," *North-Western Medical and Surgical Journal 4* (December 1855):544.

13. Weaver, *Beginnings of Medical Education*, 446.

14. James Nevins Hyde, *Early Medical Chicago: An Historical Sketch of the First Practitioners of Medicine With the Present Faculties, and Graduates Since Their Organization, of the Medical Colleges of Chicago* (Chicago: Fergus Printing Company, 1879), 47.

15. *History of Medicine and Surgery and Physicians and Surgeons of Chicago* (Chicago: The Biographical Publishing Corporation, 1922), 236.

16. "Work for the Medical Societies," *Chicago Medical Journal 6* (September 1863):425.

17. *Illinois and Indiana Medical and Surgical Journal 1* (August 1846):254.

18. *Ibid.*, 259.

19. *North-Western Medical and Surgical Journal 1* (May 1852):34.

20. Joseph McDowell, "Report on the Improvements in the Art and Science of Surgery in the Last Fifty Years," *Transactions of the American Medical Association 13* (1860):464.

Chapter VII
Paris Revisited

As he entered the new decade Brainard found himself less resilient because of emotional losses and yet more pressured—on the one side by the driving and gifted promotor John Evans and on the other side by the ardent reformer and prophet Nathan Davis. Partly to escape these pressures and partly because he had vowed to himself "to keep up," he left Chicago on October 15, 1853, for his second visit to Paris. Some of the excitement of the first trip was gone but so were the fears of a strange country. The delight in an adventure and the expectancy of new opportunities for learning were still there. Even the passage was symbolic—a sturdy steamboat in place of the fragile sloop. In twelve days he arrived in London for a day's stopover. He made good use of his time, as he recorded in the following letter to Dr. Johnson, assistant editor of *The North-Western Medical and Surgical Journal*:

London, October 27th, 1853.

Dr. Johnson: Dear Sir: According to promise, I sit down to give you a sketch of men and things in Europe, medical and surgical, as I might see them. Having but a day in London in passing, I improved it by a visit to the museum of the Royal College of Surgeons, founded by John Hunter. I was informed by the porter that the Museum was closed, and could not be seen for several days—the closing being for

the purpose of transferring the specimens to the new Hall, and re-arranging them in the old. On sending my card, with a note of introduction from a member, I was, as a foreigner, readily admitted, and Mr. Quickett, the Curator, and Mr. Luke, the President, immediately met me in the Hall, and in the most obliging manner pointed out those objects of interest for which I particularly inquired. Unfortunately the disarrangement of specimens did not allow him to point out to me more than two illustrating the effects of foreign bodies placed in contact with bone, the special object of my search, and not one of a bone, the union of which after fracture had been effected by means of the seton, wires, or other foreign bodies. Disappointed in this respect, I was not so in others, the Museum being rich in all the more ordinary specimens. Hunter's experiments on the production of necrosis by separating the periosteum, is shown by numerous preparation of bones of the Ass, in as perfect a state of preservation as the day they were deposited, side by side with pieces of wood, from parts of which the bark had been removed, where the wood, like the bone, was dead. The analogy of the periosteum and the bark was a favorite idea of Hunter.

Hunter's experiments on regeneration of tendon are perfectly shown by his preparations.

Casually pieces of the intestines of Napoleon were pointed out, but the story that they had been demanded by the French Government, as part of the remains, was discredited.

The knife swallowed by a conjurer, and which remained in the stomach for several years, until half rusted away, without much inconvenience, when it produced death by a thrust in the side from an upset of the cart, was also seen.

The duodenum of the woman who died from swallowing bent pints, is preserved perfectly filled with them, as well as several ounces taken from the stomach and intestines, and preserved in bottles.

The collections of Sir Astley Cooper and Mr. Liston

have, within a few years been added to this Museum; among the former a case of fracture of the neck of the femur, entirely within the capsule and entirely united by bone, may be noticed. This, it is said, was kept in a private collection, and never shown or alluded to by Sir Astley, although it was known to be in his possession having been presented by a friend.

Among the improvements recently introduced in the College, is a lecture room, arranged for the purpose of teaching microscopic anatomy, the first of the kind ever made use of. It consists of two benches of semi-circular form, with tables in front, upon which the microscope runs, as upon a railway. These are connected with the table of the lecturer, so that the microscope can pass from and to it. The advantages of this arrangement are, that one microscope suffices for a class, and that thirty or forty objects can thus be exhibited to a class in a single hour. This has been introduced by Mr. Quickett, the Professor of Microscopic Anatomy, who has also added to the Museum about 8,000 specimens to be viewed by the microscope. These are preserved between strips of glass with turpentine in the usual manner. The specimens preserved in fluids are placed in spirit, about five degrees above proof; the bottles are closed by placing over them first, a piece of bladder, varnished, over that a piece of thin lead, lined with tin foil, then another piece of bladder, varnished. The cholesterine which dissolves renders the liquid slightly turbid at a low temperature, but when slightly warmed, it is perfectly transparent and unchanged by time.

The new Hall, into which the specimens are being removed in part, is of vast dimensions and beautiful proportions. It was erected principally by funds of the College, the Government appropriating but a small sum for that purpose. The library contains 30,000 volumes, conveniently arranged in a very fine Hall. It does not contain a single manuscript of Hunter, of all the numerous ones which he left at his death, but the history of their destruction or

publication by a high officer of the College, as his own, has never, as yet, been more than partly given to the public. Those best informed seem to know but little of the family and personal history of Hunter. He is buried, it is said, in St. Martin's Church. He left, at his death, a son and a daughter, but whether his descendants are living, I was not able to ascertain. Such men as James Watt and John Hunter are not ennobled in England.

The governor's room contains a portrait of Hunter, by Sir Joshua Reynolds, busts of Hunter, Cline, Abernethy, Sir Astley Cooper, etc. The bust of Hunter shows his head to have been massive, very broad from ear to ear and antero-posteriorly, but proportionally, not high. Cline's is not unlike it in this respect.

The amphitheatre of the College is very handsome and spacious, capable of seating about 500 persons.

Thanks to the temporary closure of the Museum, which enabled me, instead of wandering through the Halls alone, to see the collection under the guidance of its distinguished President and the Curator, to pass an hour delightfully in interchange of views with them on professional subjects. I hope, on my return from Paris in the Spring, to spend a month in London, and make myself as much acquainted as possible with its different medical institutions and hospitals, when I may note for your readers such progressive tendencies as I may observe.

B.[1]

This delightful letter showed him in a holiday mood, but still the eager teacher fascinated by the microscope running "as upon a railway," the wheels of his own mind clicking along as he planned the same arrangement for the Rush students.

In addition to the Hunter Museum, Brainard must have stopped by the *London Lancet* office, because the same December issue of *The North-Western Medical and Surgical Journal* published a reprint of an article of his from the *London Lancet*:

> A Case of Erectile Tumor of the Orbit, Cured by Infiltration with the Solution of the Lactate of Iron and Puncture with Hot Needles, after the Ligature of the Carotid Artery had failed; with observations on the effect of that Solution in obliterating the Blood vessels. By Daniel Brainard, M.D., Professor of Surgery in Rush Medical College, Chicago, Illinois, late Vice-President of the American Medical Association, Etc.[2]

The next day he made the channel crossing. In growing excitement he stayed on the deck, dreaming of Paris, with money in his pocket that had not been there fifteen years ago. It was fun to anticipate going to dinner and not always taking the cheapest *plat du jour*, going to a play or concert and not worrying about the price of the ticket, browsing in book stores and actually buying books, talking to instrument makers as a valued client, not as an impoverished student.

The Paris to which Daniel returned had been through the February revolution of 1848 and the Second Republic which, in its turn had been replaced in 1852 by the Second Empire when Louis Napoleon seized autocratic power, declaring himself Emperor Napoleon III.

Daniel was quick to see that a revolution also was occurring in the medical world—hospital medicine was being replaced by laboratory medicine. Paris was beginning to lose ground to the German and Austrian hospitals and universities. In his second letter home, Brainard gave an excellent analysis of the Parisian medical world:

Paris, Feb. 13th, 1854.

Dr. Johnson,

> Dear Sir: There are so many objects of interest in Paris, connected with the Medical Profession, that one scarcely knows which to select for the subject of a single letter.
>
> To the stranger who was familiar with the Institutions in 1840, it does not appear, on a return at present, that much progress has been made, either in the means of teaching the doctrines taught, or the qualifications of the Professors. The Museum of the

School of Medicine, comprising healthy and comparative anatomy, specimens of *materia medica*, surgical instruments, etc., has been principally created since that period, and although not large for a national collection, is a precious addition to the means of instruction, and contains many preparations of the nervous and lymphatic systems of unequalled beauty. This collection is due to Orfila, whose name it bears. In addition to this, a new museum has been collected at the dissecting amphitheatre of Clamart, which contains some valuable pieces, but its situation, and the rules in regard to entrance, render it useless for the purposes of instruction. None of the hospitals have collections except that of Val-de-Grace, and most of the valuable specimens which might be derived from them, are lost for want of care. The Musee Dupuytran have [sic] received considerable additions, but at the present time is inferior in every department except that of bones, which is very perfect.

The changes in the School of Medicine have not all been for the best. The death of Orfila left a void, which no attempt will be made to fill, the chair which he occupied being abolished. Dumas has also retired from teaching, and in the place of the two chairs, one of the medical chemistry is to be instituted, and to be filled by Souberain [sic], already distinguished at the School of Pharmacy. Trousseau, the unrivalled Professor of *materia medica,* has been transformed into a teacher at the Hotel Dieu, where he lectures to a small number of students, his lectures revolving around the orifice of the larynx, and scarcely ever embracing more than certain diseases of the air-passages. Andral is at present but little followed, and shows strongly the marks of advancing age, and the same may be said of Cruveilhier. On the other hand, Denonvilliers has succeeded Brechet in the chair of Anatomy, and gives a brilliant and popular course in place of that but little followed of his predecessor. Malgaigne has succeeded Blandin and his course is much admired

and followed. In the Medical Clinique Bouillaud, Piorry and Rostan are still the Professors. Certain peculiarities of the first-named have so increased upon him, as to render his teaching intolerable. The second is still occupied in percussing the spleen, and marking its outlines, while Rostan continues his sound and valuable teaching in his wards at the Hôtel Dieu. In the Surgical Clinique, the Professors are Roux, Velpeau, Laugier and Nelaton; the two former too well known to need to be spoken of, but gradually declining from the effects of age; the two latter, highly popular, and rapidly advancing to the summit of reputation. The Clinique of Accouchments is directed by Paul Dubois, as formerly, than whose teaching nothing more admirable can be desired. It will be seen that in the Faculty, the gain scarcely compensates for the loss, and if the reputation of the School of Paris depended upon that alone, it might well be supposed to be upon the decline; but such is not the case, and the able corps of hospital physicians and surgeons, with the agreges chefs de clinique, internes, etc, keep up the public and private course to their former standard of excellence, although Louis has retired from his wards, and left vacant a place which cannot be filled.

Among the most notable defects of French teaching may be noticed the neglect of general pathology and the use of the microscope. Robin is nearly the only teacher of the microscope, and his class is generally confined to a small number of American students. Nachet, one of the principal manufacturers of microscopes, told me that his best customers were from America, and that nearly all of his most expensive instruments were sent there. The manufacturers of anatomical models of papier mache, plaster and wax, the preparers of skeletons and specimens of natural history, and the instrument makers, all assured me that their best customers are Americans or English. Under the head of Instruction, I should by no means forget to mention the course of Bernard at the College of

France, on Physiology; strangers, however, are apt to be disappointed in his course, as his brilliant discoveries lead them to expect too much. In other parts of his course, not relating to his own particular discoveries, he principally follows Magendie, whose place he supplies. I think that the premature publication of his opinions regarding a retrograde circulation from the veins into the arteries, through the kidneys, has tended to lessen the confidence of his hearers in his statements. His work on Experimental Physiology, which has been announced, will probably not be issued for a long time. At the side of Bernard, in the College of France, is Coste, whose lectures upon the development of organized bodies, is the most eloquent and instructive course I have ever listened to. The substance of his course is contained in his great work entitled "General and Special History of the Development of Organized Beings," which has reached its third number, being published by the government. He is known in America from his efforts in introducing the artificial breeding of fishes, a process now employed in all the different countries of Europe. I saw in his private room in the College of France, a number of troughs of earthenware, containing the eggs of fishes of the choicer kinds, such as salmon, from the lakes of Switzerland, and other kinds from the different rivers of Europe. Prof. Coste informed me that the eggs are transported without difficulty, a distance of 800 miles by land, and that they could easily be sent to America without injury. These eggs are of the size of peas, of a bright red color, and to be hatched are placed upon little racks made of willow twigs, which are fixed in the troughs so as to be covered with water, and a gentle current is kept playing over them. I saw them in every different stage of development, from the simple egg to the fish just bursting from it. It is a curious sight, and seems to promise much benefit to man, by supplying fresh and wholesome food. It has, however, its difficulties. Like

other orphans, a large portion of these fish brought up by hand, die before attaining maturity, and it is yet doubtful whether the plan will be successful, excepting with regard to those fishes found in the waters where the breeding is carried on; in this case there seems no reason to doubt its full success.

An interesting fact has incidentally been noticed by those engaged in observing this process of hatching; it is that a great number of monsters occur amongst the newly-hatched fishes, a number much larger in proportion than occurs in the mammalia.

In speaking of the scientific men of Paris, you will naturally expect me to say something of Lebert: he does not reside here at present but holds a professorship in a German University. His great work, however, on which he has been engaged for many years, is about to be put to press, and it is confidently expected that it will be by far the most perfect treatise on morbid anatomy which has ever been published. Bailliere, the great publisher, showed me some of the drawings which are in his hands to be engraved, and they are indeed magnificent. The work is so expensive that it was difficult to find a publisher to undertake it, but as the Minister of Public Instruction advances a certain sum towards the expense, and the Prussian government subscribes for a certain number of copies, Bailliere was induced to undertake it. The first number will be issued soon. While speaking of forthcoming works, I may mention that Guerin has one in hand and far advanced, on the subject of deformities, which is to be illustrated in the most perfect manner by beautifully-executed and colored plates. M. Guerin has devoted a great part of his life, and a considerable sum of money to this object, and has collected a museum comprising about 3000 pieces, illustrating every different point of the subject. This collection, which may be regarded as a national one, is now offered for sale, and it were greatly to be desired that it should be transferred to some institution in America; as may be supposed,

from the labor and money expended upon it, the price at which it is valued is not small. It may be interesting to some of your readers to know that M. Guerin, who was appointed by the Academy of Medicine some years since, to make a report on the subject of cholera, has nearly accomplished his task and is about to submit it. After the fullest investigation and the examination of innumerable documents and publications of every kind, he assures me that he is fully convinced of its communicability, but only in certain conditions, and in a manner peculiar to itself. I think this opinion is beginning to have great influence here, since the cholera patients, which were at first carried into all the wards, have lately had particular halls assigned to them, separated as much as possible from the others. So long as they were carried into the general wards, the number of cases regularly increased, but so soon as the change was made, they diminished. As this is a doctrine which I had advocated for many years, it is gratifying to find its truth at length being recognized, more particularly as it is the only means by which the spread of the disease can be explained, and its ravages, to a certain extent, controlled. If time and space permitted, I should still have much to say of societies, journals, medical doctrines and men, past and present, but as I have occupied enough of both, they must be deferred to another time, or entirely omitted.

Very truly yours,

B.[3]

In this letter Brainard clearly noted the weakness of Parisian teaching in pathology and microscopic anatomy and showed the shift of his own attention to physiology and experimental medicine as well as his continued interest in the problem of cholera.

November in Paris was busy. Brainard had friendships to renew and contacts to make. Once again with the help of Marie Jean Pierre Flourens he arranged to work at the Jardin des Plantes. His plan was to continue to study the treatment of

snake bites and poisoned wounds. He had brought with him a specimen of curare from the Amazon, given him by Dr. David Green of New York. Through the courtesy of Prince Charles Bonaparte, Dr. Flourens also obtained another specimen for him and his co-worker, Dr. J.W .Green, to study.[4]

Brainard had an additional objective on this trip to Paris. He had brought with him two papers. Weeks and months and years of experimental work were summarized in these papers and he was determined to present them in Paris. This feat would require ability, diplomacy and tact. No one, least of all Brainard, himself, questioned his ability, but diplomacy and tact were not his strong points. For important goals, however, he could muster these traits. So to his pride, on November 28, 1853, he addressed the prestigious Academy of Science on his experiments on the venom of rattle snakes and the effects of the venom and means of neutralizing its absorption.[5] The paper was referred to a committee consisting of Messrs. Dumeril, Magendie, Flourens and Pelouze, and was summarized in the *Gazette des Hopitaux.* Both the stature of the members of the committee and the summary in the *Gazette* indicated the importance ascribed to this paper.

Several months later the Academy of Science invited Brainard and his co-worker, Dr. Green, to report on their current work on iodine as an antidote to curare. After his return to the United States Brainard combined these two reports for his presidential address to the state medical society. It contained a graceful tribute to Velpeau who had done groundwork studies on the effects of iodine on body tissues, an expression of gratitude to Drs. H. A. Johnson and J. C. Morfit for making the microscopic examinations and drawing the plates, and a note concerning his indebtedness "to my young friend Robert Kennicott for procuring for me as many serpents as I needed for my experiments, and for many valuable facts in relation to the effects of poison."[6]

On December 6, 1853, as a candidate for membership in the Society of Surgery as a foreign correspondent, Brainard read a memoir entitled, "On the injection of Iodine into the Tissues and Cavities of the Body for the Cure of Spina Bifida, Chronic Hydrocephalus, Oedema, Fibrinous Effusions, Oedematous Ersipelas, etc., etc."[7] The paper was referred to a committee of Messrs. Nichon, Monad and Larrey (the son of Dominique

Larrey, Napoleon's surgeon) and also was summarized in the *Gazette des Hopitaux.* As a result, Brainard was elected a foreign corresponding member of the surgical society, an honor which he cherished all his life.

Winter flew by and Brainard sailed for home, foregoing the stop in England in order to see his family sooner. Once again his mind was teeming with ideas and experiments, with solutions and new approaches, and again he felt that he could meet whatever problems would arise.

In the spring after he returned from France, Brainard attended the American Medical Association convention in St. Louis in May of 1854. This gathering was deemed a national event for St. Louis and the first medical convention to be held in the "West." The physicians of St. Louis were determined that it would be a memorable event. In addition to the clinical program, there were a thrilling sixteen-mile train trip and a banquet to end all banquets. St. Louis had attained its goal: no one ever forgot the convention, although for varying reasons. Nathan Davis, a strict teetotaler was shocked and disgusted, but most of the physicians remembered Western hospitality all their lives.

To Daniel Brainard the meeting was memorable for another reason. The American Medical Association held a prize contest for the most meritorious essay of the year. The essays, without author identification, were sent to the selection committee and after a process of elimination the best essay was chosen at the national meeting. With much fanfare the committee chairman announced the title of the prize essay and then the president of the association revealed the name of the author of the essay. That year the title of the essay was "A New Method of Treating Ununited Fractures and Certain Deformities of the Osseous System," and the author was Daniel Brainard.[8]

The essay dealt with one of the most common and difficult problems that surgeons of that period faced—non-union fractures. Often the victims suffered their fractures far from any available medical help, and many of the fractures were compound or comminuted. If the fracture was in a weight-bearing bone and failed to heal, the patient faced lifelong invalidism. The alternatives were no happier. Open surgery could not be done because of the potentially disastrous results of infection; but amputation had a morbidity and

mortality rate that was almost as forbidding.

Brainard attacked the problem in his usual meticulous manner. He read the books and all the reports in the medical journals, and he talked and corresponded with other surgeons to garner their experience. Then he experimented on dogs, trying the old methods and then inventing a new method of stimulating callus formation. When he went to Paris, he examined all the specimens of fractures and callus formation that he could find in the museums. Then he tried out his new technique on cadavers in the dissecting rooms. It consisted of a specially constructed bone drill or "perforator," introduced subcutaneously to perforate the bone ends to simulate a recent fracture and thus to stimulate callus formation. Then he immobilized the bone until healing would take place. As a result of these innovations, Brainard succeeded in healing sixteen out of seventeen cases of delayed union of a fracture.

One of Brainard's dreams was fulfilled in the spring of 1854 in Paris. The recognition of his experimental and clinical research admitted him to a scientific and intellectual group which delighted him. When in the same year the American Medical Association honored him, the award kindled his ambition to become one of the small circle of nationally renowned surgeons that included Valentine Mott of New York, John C. Warren and Henry Bigelow of Boston, and Samuel Gross of Philadelphia.

Notes

1. *North-Western Medical and Surgical Journal 2* (December 1853):513-516.

2. *Ibid.*, 545.

3. *North-Western Medical and Surgical Journal 3* (April 1854):145-149.

4. Daniel Brainard, "Essay on a New Method of Treating Serpent Bite and Other Poisoned Wounds, Being the Annual Address Delivered Before the Illinois State Medical Society, June 7th, 1854" (Chicago: J. F. Ballantyne, 1854), 8.

5. E. Fletcher Ingals, "The Life and Work of Dr. Daniel Brainard," *Bulletin of the Alumni Association of Rush Medical College 9* (July 1912):9.

6. Brainard, "Essay on a New Method of Treating Serpent Bite and Other Poisoned Wounds," 26.

7. *North-Western Medical and Surgical Journal 3* (February 1854):89-91. Translated from the *Gazette des Hopitaux.*

8. Daniel Brainard, "Prize Essay: Essay on a New Method of Treating Ununited Fractures and Certain Deformities of the Osseous System" (New York:Baker, Godwin & Co., 1854), 44.

Fig. 19. Rush Medical College in 1855. (Photo courtesy of Chicago Historical Society.)

Chapter VIII
Academic Civil War at Rush

In 1855 an opportunity arose to test Brainard's resolve to enter into the select circle of nationally known surgeons. This opportunity came as a result of the retirement of William Gibson, the head of surgery at the University of Pennsylvania Medical School. Brainard yearned to occupy this position and so he quickly but quietly let it be known that he would be available and asked friends such as William Ogden to write their contacts in Philadelphia.[1] The faculty of the University of Pennsylvania recommended Brainard as its first choice. The board of trustees, however, chose Henry H. Smith—a man as commonplace as his name but with excellent connections (a father on the board).[2] Brainard was bitterly disappointed. He felt that his opportunity to become a surgeon of national repute had slipped through his fingers. In his own bitterness he failed to note that some of his young and ambitious colleagues were also disappointed that he was not leaving.

Time buried his disappointment under a workload imposed by the fact that after eleven years the student body had outgrown its building and its faculty. Classes of over a hundred had strained the capacity of the dissecting room and the laboratories to the point that students were hanging out windows and latecomers pulled bulging doors closed behind them. So in the summer of 1855, the old school was torn down and a new larger one was constructed at an expense of $15,000 borne by the faculty.

Erecting a new building, however, was less traumatic than replacing and expanding the faculty. Even the initial addition of John Evans to the chair of obstetrics—successful as the four founders considered this appointment to have been—disturbed the even tenor of their ways. McLean, Herrick and Blaney were horse-and-buggy men who felt that taking a stage coach was quite dashing and who considered Brainard's support of the canal as forward looking. In contrast, John Evans dreamed of railroads and steam engines, and by 1855 he had seen his dream transformed into the actuality of the Fort Wayne and Chicago Railroad. A consolidation with the Pennsylvania Railroad was in the future plans.[3]

Brainard admired Evans's business ability and was persuaded to join him in a real estate deal, which consisted of securing a twenty-year lease on four lots on the east side of Clark Street opposite the Sherman House for the sum of $1,000 and taxes. Here the partners erected the Evans Block, a three-story brick structure which housed the Chicago post office, the editorial rooms of the *Chicago Tribune* and various mercantile establishments. Soon the building became so profitable that the owners of the land regretted their deal and sued for annulment of the lease. Brainard became alarmed at this juncture, fearing that he might lose his entire investment; but Dr. Evans, with his father's aid, purchased his partner's interest, fought the suit and finally compromised with the owners for a rental of $3,000 a year.[4]

Evans's interests were not limited to business. His enthusiasm now turned to the founding of a Methodist university. By 1855 he had laid the foundation for Northwestern University and planned the suburb of Evanston. At this time he closed his medical office but continued to teach obstetrics at Rush until 1857.

As had been the case with Evans's appointment, so too the appointment of Nathan Davis and his advancement the following year to the chair of medicine had been considered triumphs. But in contrast to the genuine fondness that existed for John Evans, in spite of his brashness, there was a reluctant dislike of Nathan Davis, in spite of his virtues. Isaiah crying in the wilderness did not fit comfortably into the confines of a faculty meeting. Daniel Brainard was especially annoyed by Davis's constant harping on a sequential curriculum. It was not

that Brainard disagreed with the basic idea, but he felt that more patient contact in dispensaries, clinics and hospital rounds were what students needed rather than more lectures. He also felt that it was obvious that one had to find the instructors before one could schedule the lectures. To most of these arguments of Brainard's, Davis was oblivious, partly because he had never founded a school. He also did not see that Brainard had a real gift for finding excellent teachers—including Davis himself. Davis not only harped, he also carped—the city was dirty, the school fees were too high, the school term was too short. Brainard had been punctilious in fulfilling all his promises to Davis, but after the first two years he grew increasingly irritated by Davis's insistence on reforms in the school which he and the original faculty had struggled so hard to establish. Relations became progressively more strained. Communications grew infrequent and brusque and finally after 1855, Brainard no longer sent his papers to *The North-Western Medical and Surgical Journal*, which Davis now edited.

In this chilly atmosphere John McLean questioned whether traveling to Chicago from Michigan for the school term was worth the effort and at the end of the 1854-55 term he resigned. He had served as the balance wheel of the group—always punctual and prepared, always willing to take on an extra load or adjust a schedule. McLean's position as the only listener among a group of speakers and orators had been unique. For all these reasons, he was sorely missed by faculty and students. In the July, 1855 issue of *The North-Western Medical and Surgical Journal*, Nathan Davis published the following formal Preamble and Resolution:

> WHEREAS, John McLean, M.D., of Jackson, Michigan, has been connected with the faculty of Rush Medical College, first in the capacity of Prof. of Practice, and subsequently filling the chair of *Materia Medica*, from the foundation of the Institution; and whereas, he has this day signified his desire to be relieved from the further responsibility of the chair which he has filled so long and successfully by sending in his resignation of said place, Therefore,
>
> *Resolved*, That the Faculty of Rush Medical

> College, in parting with their late colleague, Prof. John McLean, with whom they have been associated for several years, take pleasure in bearing testimony to his high moral qualities, his uniformly, kind and gentlemanly deportment, and his faithful discharge of the duties imposed on him as teacher of an important department of Medical Science.[5]

Hosmer Johnson, who the previous year had given the lectures in physiology, replaced McLean. The situation was further complicated by the sad fact that William Herrick's health had never been the same since an illness that he had acquired in the Mexican War. At first Brainard had had Joseph Freer, a Rush student who had been a demonstrator, take over microscopic anatomy in order to lighten the load for Herrick. But as Herrick's neurological status continued to deteriorate, he was switched to the chair of physiology, on the theory that since there was less known about physiology there was obviously less to forget. After two years Herrick retired and Freer was named professor of anatomy with Dr. Edmund Andrews as assistant and demonstrator.[6]

Meanwhile John Evans became more engrossed in Northwestern University, and in 1857 he resigned his teaching position but willingly continued on the board of trustees. With his help Brainard found William Byford of Evansville, Indiana for the chair of obstetrics.[7] Byford was a fine obstetrician, a good teacher, and a champion of medical education for women. Evans also had persuaded James Blaney to take the chair of chemistry at Northwestern. Because Blaney was intensely loyal to Brainard, he continued to teach and to practice at Rush. However, he moved his home to Evanston, planted a rose garden, and centered his interests on family, home and garden.

In the fall of 1857, after all these changes had been made, Brainard went out of town on business. When he returned just before the opening of the school term, he found that at a prior faculty meeting Nathan Davis had pushed through all the proposals for which he had been lobbying during the past six years, and they were to be presented at the next meeting of the trustees. Brainard was furious. He felt that the faculty had been presumptuous and disloyal, and that he had been betrayed. Controlling his anger, he said that he would present

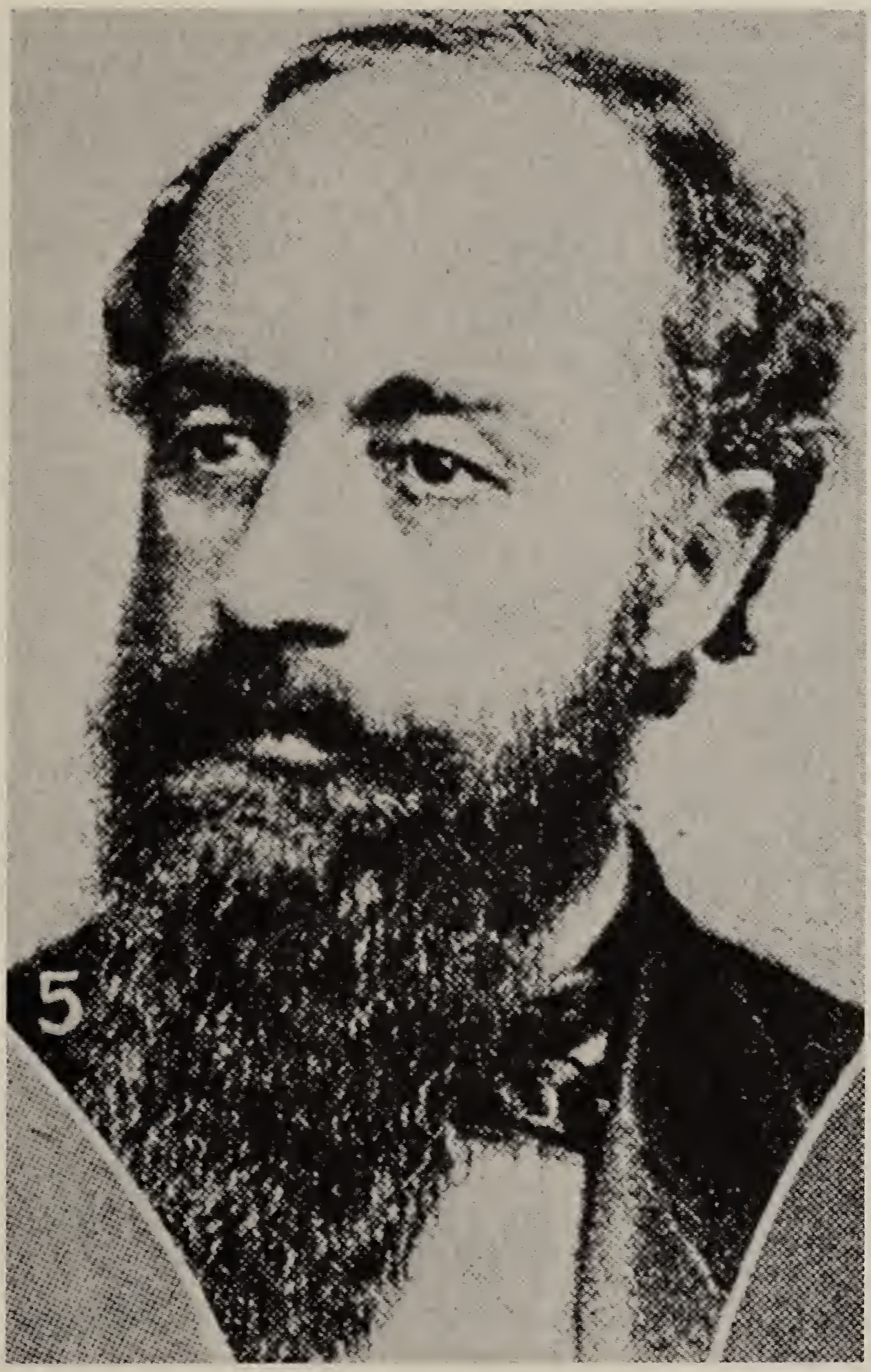


Fig. 20. J. Adams Allen (1825-1890). (Photograph reproduced from History of Medicine and Surgery and Physicians and Surgeons of Chicago. *The Biographical Publishing Corporation, Chicago, 1922, with the permission of the Library of Rush University.)*

the proposals to the board. The faculty members were disgruntled because they felt that they, too, should be present at the meeting, but Brainard was adamant and perhaps, arrogant. After the trustees' meeting Brainard reported to the faculty that the board had not accepted the plans because it felt too much expense would be involved. So the projects were dropped and the previously chilly atmosphere now became sulphurous and combustible.

Perhaps it was the feeling that his control of the medical school was slipping away that made Brainard impulsively accept the Democratic nomination for mayor of Chicago in 1858. The campaign was exceptionally bitter, both for local and national reasons. The local reason centered on deteriorating living conditions which had resulted in the "beer riots." The national reason was the issue of slavery. By March 1 one of the local papers was screaming: "Every pimp, every shyster, every blackleg (thief), base men and lewd women are working with fiendish energy to elect Dr. Brainard." The results on March 25 showed Haines, the Republican, with 8,642 votes and Brainard with 7,481.[8]

In 1859, two years before the Civil War disrupted the country, a civil war struck Rush Medical College. In both instances, a long series of events led up to the final break. In 1857 Lind College had been formed and by 1859 the founders were eager to acquire professional schools. They approached two junior members of the Rush faculty—Dr. Hosmer Johnson and Dr. Edmund Andrews—with the project of starting a new medical school. Johnson and Andrews in turn recruited Drs. Ralph Isham and David Rutter, and had as silent partners Drs. William Byford and Nathan Davis. This was an unusual role for Davis, but he was the type of prophet who, while crying in the desert, still knew which oases had the best date palms.

On March 12, 1859, the four original members accepted the proposal of the trustees of Lind University to form the Chicago Medical School. They then offered professorships to Drs. Byford and Davis, who resigned from the Rush faculty to accept these new positions. Dr. Davis also persuaded Mercy Hospital to change its affiliation.[9] The tremendous drive for power and ascendency that consumed both Davis and Brainard made a complete break inevitable.

As a result of these defections, Daniel Brainard found

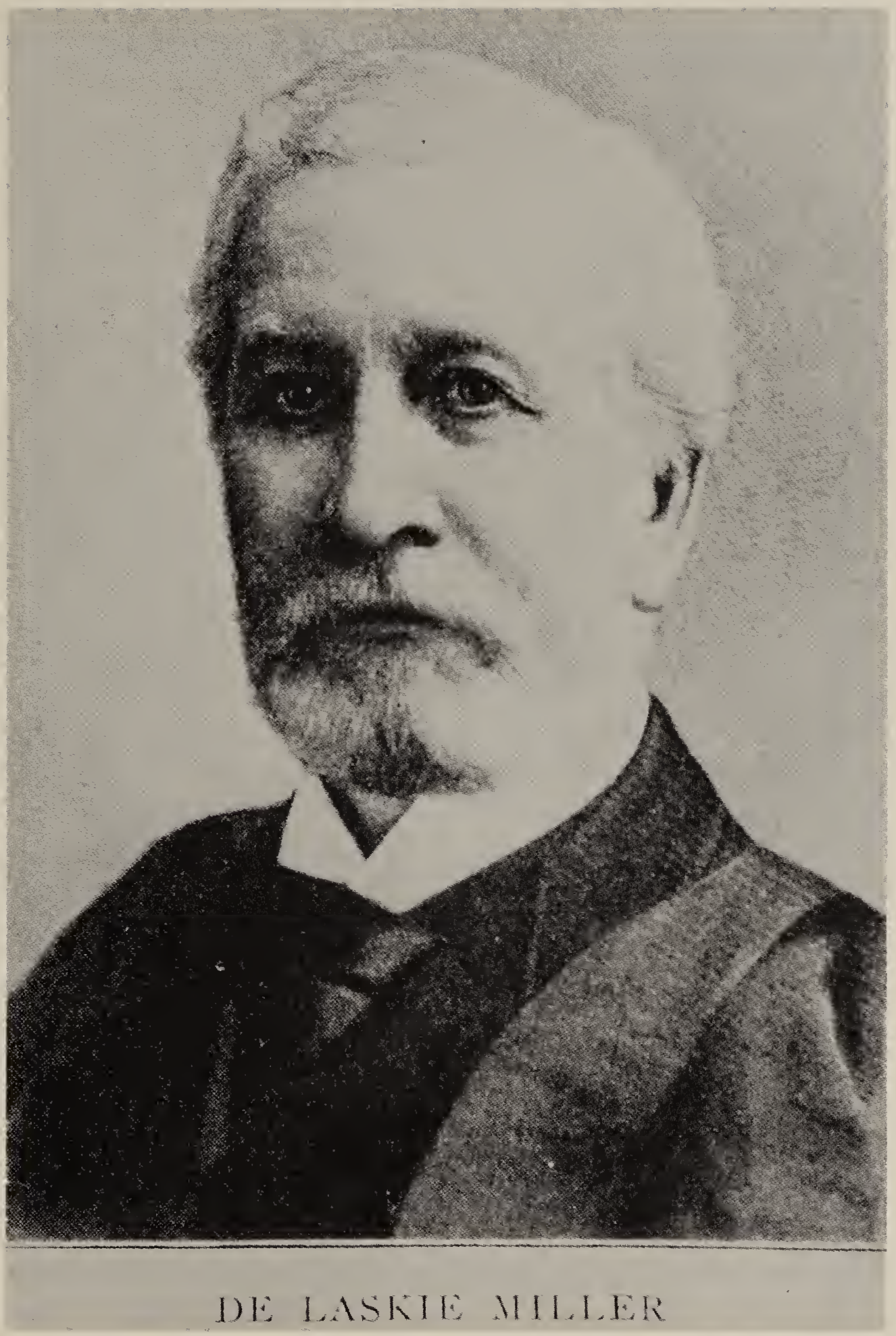


Fig. 21. DeLaskie Miller (1815-1903). (Photograph reproduced from History of Medicine and Surgery and Physicians and Surgeons of Chicago. *The Biographical Publishing Corporation, Chicago, 1922, with the permission of the Library of Rush University.)*

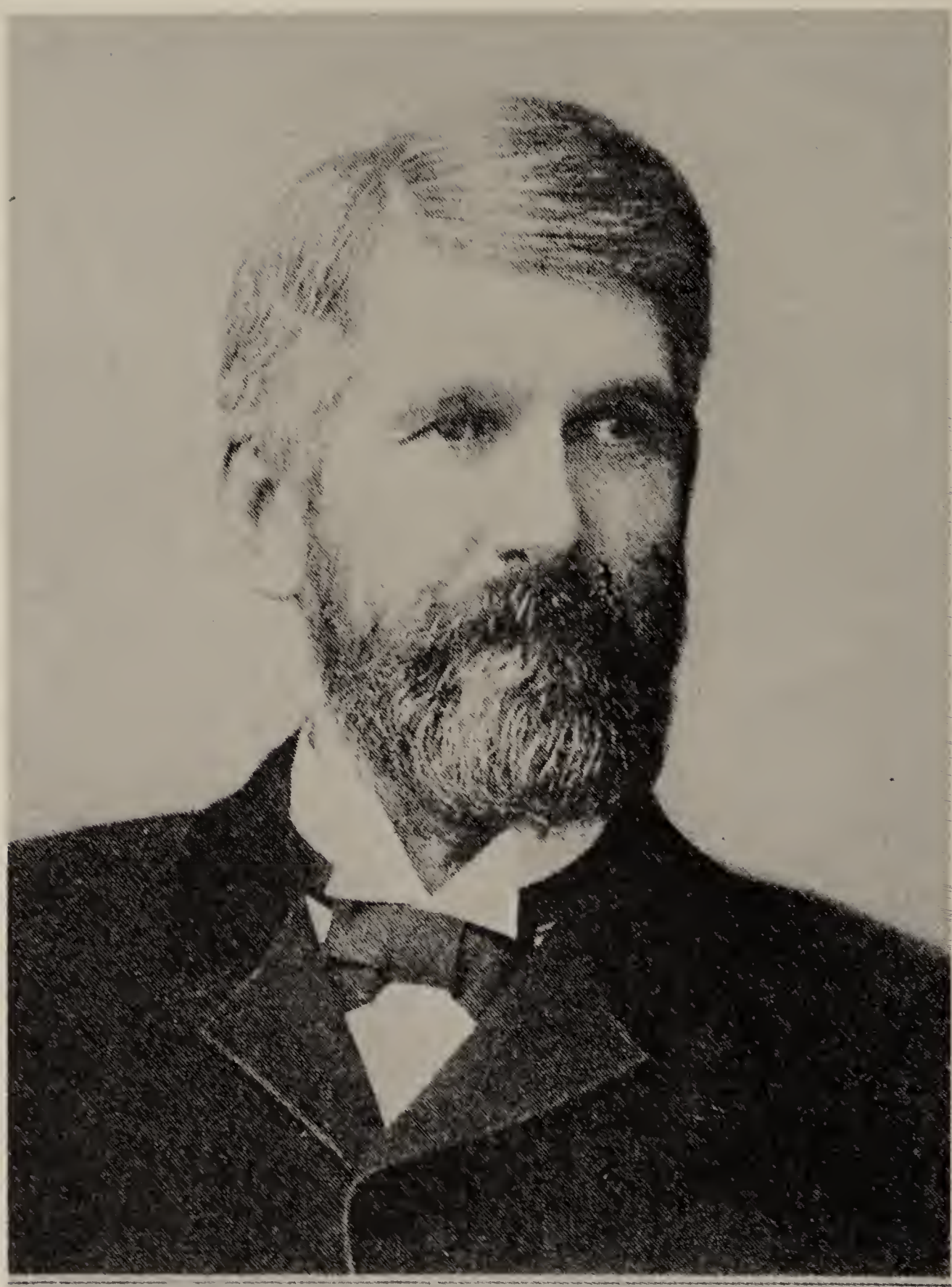


Fig. 22. Robert Laughlin Rea (1827-1899). (Photograph reproduced from History of Medicine and Surgery and Physicians and Surgeons of Chicago. *The Biographical Publishing Corporation, Chicago, 1922, with the permission of the Library of Rush University.)*

himself with a school, but lacking professors of medicine, obstetrics, pathology and physiology; lacking a major teaching hospital; and lacking an editor for the journal. He was as angry as he had been two years before, but at least this was an amputation rather than a festering wound.

During a summer of intense activity Brainard recruited faculty to fill the vacant posts. First he found a new chief of medicine in Jonathan Adams Allen, who was head of pathology at the University of Michigan. "Uncle Allen," as he was called by the students, held the position for thirty-one years, the last thirteen of which he was also president of the college.[10] The head of obstetrics, DeLaskie Miller, was also from Michigan and his tenure lasted thirty years, just one year short of Dr. Allen's.[11] The head of anatomy was Robert Laughlin Rae, who stayed at Rush until 1875 and was considered an outstanding teacher.[12] Joseph Freer, whose training at Rush had made him flexible, was again teaching microscopic anatomy and physiology and continued to do so until his death in 1877.[13] A Rush graduate of 1847, Ephraim Ingals was appointed professor of *materia medica* and therapeutics, a position he held until he retired in 1871.[14] The faithful Blaney still taught chemistry, and there was no question of who taught surgery.

Brainard had also both literally and figuratively been eyeing young Edward Holmes, who three years before had come to Chicago to start his private practice of ophthalmology. Holmes was well prepared, having graduated from Harvard Medical School, interned at Massachusetts General Hospital and studied abroad in Paris, Berlin and Vienna. After two years of practice he founded Illinois Charitable Eye and Ear Infirmary.[15] Since Brainard felt that specialization was the road of the future, he had observed Holmes with interest and then affection. During the summer he asked Holmes if he would be the lecturer in ophthalmology. This was one of the first appointments of an ophthalmologist to a medical faculty and gave Brainard great satisfaction—not only was he furthering his ideal of specialization but he had found the best man for the specialty. This decision was in direct contrast to the opinions expressed by Nathan Davis, who was as opposed to specialization as he was wedded to a graded curriculum. Holmes went on to teach for forty years at Rush. In an address to a graduating class at Rush, Holmes had expressed his wish:

"May each of you grow old and wear out in the service of others."[16]

When autumn came with as large an enrollment as ever and not a single defection to the other school, Brainard knew that he had saved Rush. Always a good judge of ability, this time he had been an equally good judge of stability. Brainard not only had saved his school for a term, but had anchored it for generations. Bitter and divisive as this conflict was, it resulted in a heritage of diversity in medical care and medical education from which the community benefited.

Notes

1. March 9, 1855 letter from Henry D. Gilpin to William B. Ogden concerning Dr. Brainard's application to succeed Dr. Gibson, from the manuscript collection of Chicago Historical Society.

2. Professor of surgery in the University of Pennsylvania, *North-Western Medical and Surgical Journal 4* (July 1855): 339-340.

3. Edgar Carlisle McMechen, *Life of Governor Evans, Second Territorial Governor of Colorado* (Denver: Wahlgreen Publishing Co., c1924), 76-79.

4. *Ibid.*, 75-76.

5. *North-Western Medical and Surgical Journal 4* (July 1855): 341.

6. *Ibid.*, 340.

7. *History of Medicine and Surgery and Physicians and Surgeons of Chicago* (Chicago: Biographical Publishing Corporation, c1922), 50-53.

8. William K. Beatty, "Daniel Brainard—Pioneering Surgeon and Teacher," *Proceedings of the Institute of Medicine, Chicago 34* (January-March, 1981), 3.

9. Leslie B. Arey, *Northwestern University Medical School, 1859-1959: A Pioneer in Educational Reform* (Evanston, Illinois: Northwestern University, c1959), 33-39.

10. George H. Weaver, "Beginnings of Medical Education in and near Chicago: The Institutions and the Men," *Bulletin of the Society of Medical History of Chicago 3* (September 1925), 384.

11. *History of Medicine and Surgery and Physicians and Surgeons of Chicago*, 53-54.

12. *Ibid.*, 72.

13. *Ibid.*, 48.

14. *Ibid.*, 64-65.

15. *Ibid.*, 75-76.

16. *Ibid.*, 75.

Chapter IX
National Civil War

With the problems of the medical school rebellion and secession resolved, Brainard looked outward to find that the entire nation was as tense, divisive and bitter as his personal world had been. Still, the firing on Fort Sumter on April 12, 1861 and the Declaration of War on April 19, 1861 came as a surprise to him. For a time he felt that it might all be over in two or three months, but as the long, hot summer dragged on, he knew it could not be a short war.

As a surgeon Brainard expected and wanted to be called to active service, but there was no indication from the army about drafting of physicians. Nor was there any indication of how many of the Rush faculty or students would be called or volunteer. Although he thought the school enrollment would be drastically reduced, Brainard could not gauge how many students would return. Finally he decided that the future could only be met a day at a time.

Meanwhile the Army Medical Corps, the source of leadership and information for physicians, appeared paralyzed and voiceless. There were a number of reasons for this inactivity. The Corps had always been small in times of peace and augmented in war by physicians and surgeons drawn from civilian life. At the onset of the Civil War there were only thirty surgeons, eighty-three assistant surgeons at lonely frontier outposts, a few naval surgeons on a few boats, and an eighty-year-old Surgeon General. Upon the declaration

of war, three of these surgeons and twenty-one assistant surgeons resigned from the Corps and entered the Confederate service.[1]

The situation was further complicated when on May 13, 1861, less than a month after the declaration of war, Thomas Lawson, the U.S. Surgeon General, died after a long illness. He was replaced by Clement Finlay, a relic of the Mexican War, who had nothing to recommend him other than seniority. He did not grasp the enormity of the problem that he was facing, but then neither did the Congress, whose members increased the size of the medical department by only ten surgeons and twenty assistant surgeons. These numbers were miniscule compared to the 12,343 medical officers and contract surgeons who ultimately served in the war.

In addition to the Army Medical Corps, regiments supplied by the states had a surgeon and sometimes an assistant surgeon, named either by the governor or the commanding officer. In Illinois a State Board for examining Candidates as Surgeons and Assistant Surgeons to the Illinois Regiments of Volunteers supervised this selection. Brainard was named to this board and served throughout the war. As he had trained many of the younger surgeons and knew most of the older surgeons in Illinois, he proved to be a very valuable member of the board.[2] Since Illinois troops served in the Western Campaigns and saw bloody action from Shiloh through Sherman's March, they needed the best of medical care.

During the first year of the war, the Army Medical Corps announced examinations for several hundred officers but scheduled the examinations at a slow bureaucratic pace. No move was made to set up general hospitals, nor were changes made in the completely inadequate provisions of the quartermaster corps for removal of the wounded from the battlefield. No care was provided for the men in training camps—where epidemic disease was rampant among young recruits.

In fact, most of the care received by soldiers was improvised by the National Sanitary Commission, a civilian group of self-appointed but very able advisors resembling the Red Cross of today. This commission operated nationwide through local branches. Brainard was asked to head the Chicago branch but declined with regret because of his other responsibilities. In his

stead Mark Skinner, president of the Rush board of trustees, became the head of the Chicago committee.[3] The various local branches set up hospitals in hotels, churches and meeting halls. They secured local doctors to help in the transport of the wounded and local women to aid in the nursing. They rounded up food, clothing and bedding. They also made observations and investigations—which by the end of 1861 convinced them that the army's medical department had to undergo a complete revolution, including the appointment of a new chief, before it would be able to function adequately.

As a result, the National Sanitary Committee prepared a bill reorganizing the department and pushed it through Congress. They had also conducted a search for a new surgeon general and selected as their candidate William G. Hammond, an assistant surgeon. Only thirty-four years old, Hammond had already earned a reputation for intelligence, resourcefulness and energy. Against considerable opposition, the committee finally got his appointment approved in April of 1862.[4] This appointment was received enthusiastically in Chicago, especially by the Michigan men, Allen and Andrews, who had known him at the University of Michigan Medical School. As the fall of 1861 approached, news of the Union defeats at Bull Run and Manassas heightened both anxiety and patriotic fervor. Chicago was in a flurry of action—volunteers marched to and fro, supplies were moved hither and thither, women baked and knitted, men raised money and formed more committees.

Routine activity continued at Rush, although with some surprises. The fall session of the medical school opened with the general introductory lecture held at 7:30 p.m. on October 16, 1861, at the College Hall.[5] The surprises were the large enrollment of students (134) and an intact faculty. Brainard gave a special course on military medicine to which the students attended with extra zeal. All the classes took on an added significance as both teachers and students realized that in another year they might be applying their knowledge on the battlefield.

The usual internecine wars smouldered. Rush gloated about its large enrollment; the rival school suffered as a result of Mr. Lind's bankruptcy and the resulting withdrawal of monetary support. The journal edited by the Rush faculty ridiculed the

Davis group for wishing to continue the American Medical Association convention, which would have been held in Chicago with Davis presiding. Physicians quarreled about the presence of homeopaths on the draft examining boards and their acceptance as army physicians. The volunteer physicians recruited by the Sanitary Commission clashed with the regular Army Medical Corps. As the demand for doctors became more acute, however, the petty quarrels subsided.

Fortunately by the spring of 1862 the Chicago branch of the National Sanitary Commission under Mark Skinner's direction had become very well organized and supported. It was said that Skinner could have a train rolling south within a day of a call for help. The doctors responded with alacrity, the medical students with excitement and lay people with care and devotion. These expeditions were not only manned; they were also supplied with medicine, nursing supplies, food, clothes and bedding for the wounded.

Brainard made a number of trips for the commisson but left no recorded reports. Robert Rea, the professor of anatomy at Rush, reported his own trips for the *Chicago Medical Journal.* The first call was to Fort Donelson, and Dr. Rea reported the details:

> Tuesday morning found us aboard the train on the Illinois Central bound for Cairo, with hospital stores and delicacies. . . . Our train was so long and heavy . . . that before arriving at Cairo on an up grade—the track was slippery from the falling rain and sleet—we had three engines to take us along, and then had to take the advantage of down one hill to up the other. . . .
>
> We did not arrive at Cairo until 10 A.M. Wednesday, six hours behind time. . . . We set out together at Cairo to find "Head Quarters," as only by passes can you get about in that martial law town. We found, as had been intimated before arriving, that no passes were issued to Donelson—orders absolute. The excuse given by Gen. Paine, was that his jurisdicion only extended to Paducah. . . . We took our passes to Paducah. . . . However, we got word that the Governors of Indiana and Illinois . . . were on a

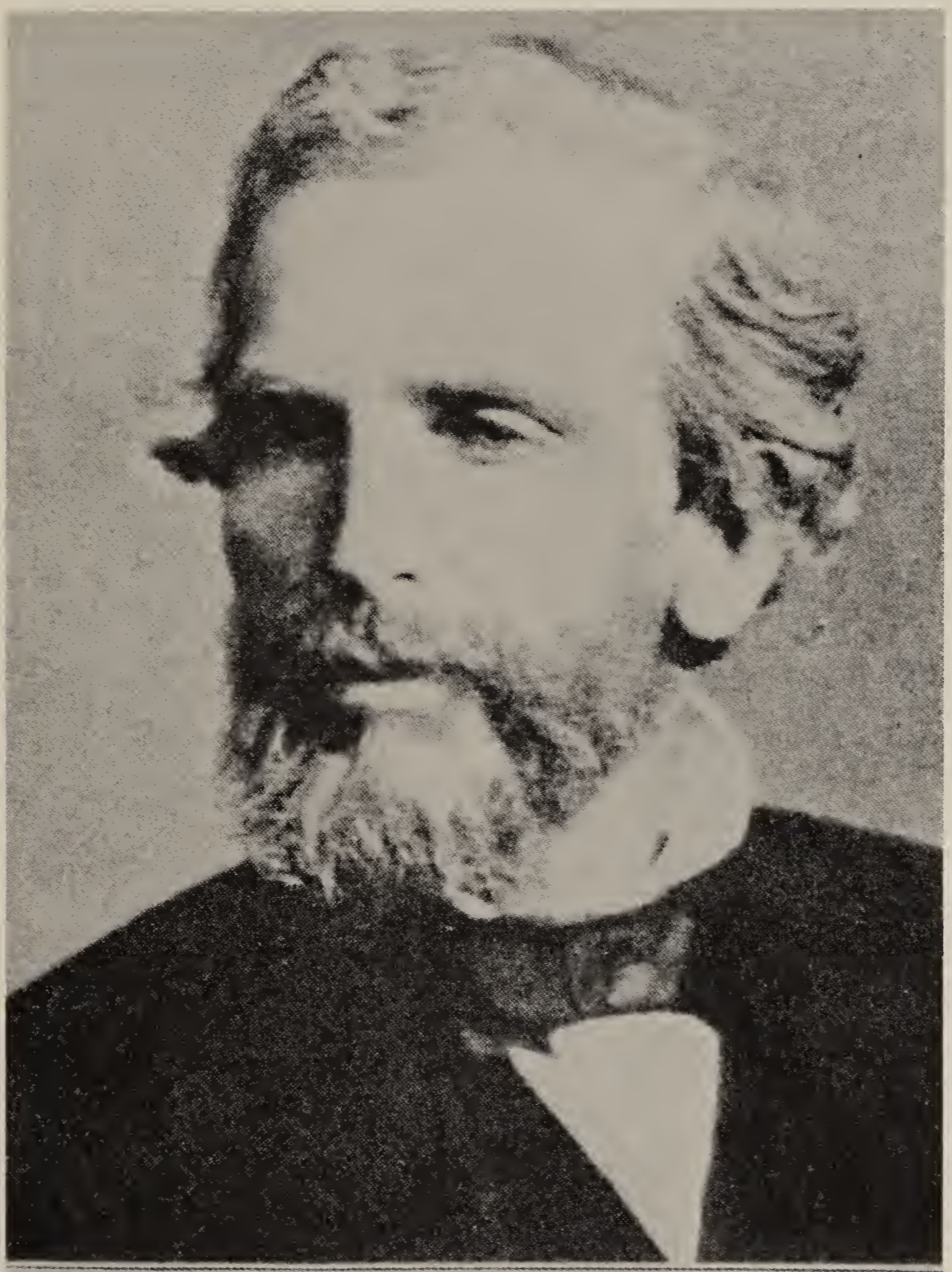
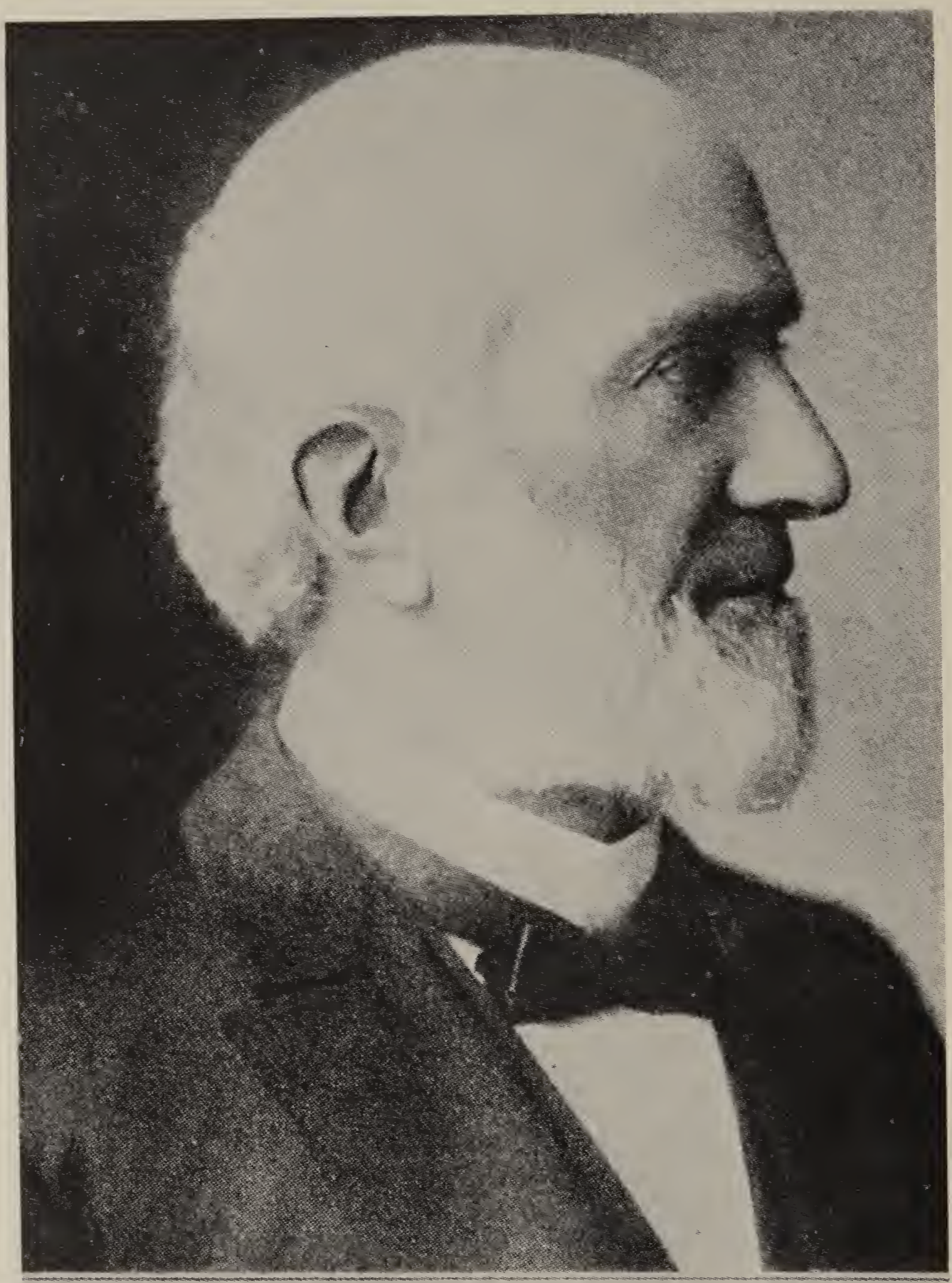


Fig. 23. Joseph Warren Freer (1816-1877). (Photograph reproduced from History of Medicine and Surgery and Physicians and Surgeons of Chicago. *The Biographical Publishing Corporation, Chicago, 1922, with the permission of the Library of Rush University.)*



EPHRAIM INGALS

Fig. 24. Ephraim Ingals (1823-1900). (Photograph reproduced from History of Medicine and Surgery and Physicians and Surgeons of Chicago. *The Biographical Publishing Corporation, Chicago, 1922, with the permission of the Library of Rush University.)*

government boat, *Belle of Memphis*, going up to Fort Donelson— and *had been for twenty-four hours*. That was suggested as the most certain way of getting up, and so we got our baggage aboard. . . . We arrived in sight of Donelson on next afternoon, Thursday. . . .

I arrived at the river about 2 P.M., and set out about finding where there was work to be done. I went aboard the *City of Memphis*, and found it to be the Hospital Boat, and without a surgeon except the boat Surgeon, Dr. Turner himself. This boat receives the sick and wounded as a depot, and then sends them off by other boats, as may be directed. There were on board over 200 wounded soldiers, and one may well wonder how much headway one Surgeon could make in such a list of cases, and in addition have the entire charge of the boat, moving patients, &c.

I met Dr. Turner, who politely invited me to go work, and I was soon engaged in all the military surgery the most anxious could desire. When I started I began alone to work on one end of a long tier of cases. Very soon Prof. Andrews, of this city, came aboard, and we divided the boat between us. Soon, also, Drs. Rogers, Hahn, Walker, of this city, Dr. Perry of Hunter Station, and Dr. Wyman, of Rockford, came and gave us valuable assistance. The wounded occupied the cabins of the boat from one end to the other; arranged with their heads towards the state rooms, and as close together as the mattrasses [sic] could be placed. The state rooms were all filled also, except a few at the stern for the officers and nurses. The sick were placed principally in the state rooms, wounded outside. . . .

We had a work before us that could well move the deepest feelings of the most insensible heart. There lay twelve score of men who had perilled their lives for us and our country. . . . I continued up, working with my cases until three o'clock next morning, and by that time we had succeeded in rederessing all the wounds and making them comparatively comfortable. . . .

The wounds were of almost every possible variety. . . . Two wounds of the head by balls, both balls entering brain; one had died and other would. One struck by passing ball, depressing skull; I trephined him, but he would probably die. One upper jaw shot out; one lower jaw struck by a ball at symphysis and broken into four pieces, one piece taken out and others very much dislocated by action of muscles. He was a brother of one of our students of 1860-1, who was with him and giving him a brother's care. . . . One case a bullet entered the external ear coming out on the opposite side between the jaws in front of the ramus, cutting the palate severely. . . . Three cases of bullets directly through lung, all died. Two were of Minié balls—holes very large—and both of them suffered very much. . . .

Very many were shot through lower limbs. . . . We had several cases of amputation on board. . . . All the operative surgery had been performed before, as it was a week after the battle. The wounds made by the balls of different kinds were generally easily distinguishable. The modern Minié ball, from its great size and tearing qualities, will most likely largely increase the mortality from wounds, of those not killed immediately. . . .

The wounded were mostly very patient and easily satisfied, and grateful for attention. They seldom complained. One poor fellow, whose breast had been bored through by a Minié, suffered excruciatingly at every breath—seemed as though he couldn't die. I think I never had my sympathies more completely stirred. His name was Allen, from Effingham, in this State. I raised him often, to try to cough the mucus and blood from his clogged throat, and the air would escape by the bullet holes . . . until I stopped them with my fingers. . . .

On Friday afternoon we changed to another boat seventy five of our cases—bound for Cincinnati. On Saturday morning we had some stores from Chicago put aboard: wines, jellies, lemons, brandies, and it was a great comfort to our suffering patients. . . .

We left on Saturday morning and arrived at our destination, Mound City, the next morning. We lost six or eight on the way. Two cases of amputation died.... It rained Saturday; and while we kept as well aired as possible, the stench became almost unsupportable. The consequence was we had four cases of Erysipelas before we got to Mound City.

I went through the hospital at Mound City on Sabbath, and was greatly pleased at the admirable arrangements it contains. It is one side of an entire square, upon which a business block of buildings had been erected. They have been fitted in a substantial and convenient manner for wards, and it makes a magnificent hospital.... The wards are very numerous, well ventilated, light, clean and comfortable. The patients and their beds are clean. Their food is of good quality, well cooked, and put before them in an eatable shape....

I saw of the Sisters of the Sacred Heart there, who have the supervisory care of the nursing and [they performed] admirably. I was more than pleased at the quiet, orderly and unobtrusive way in which they performed their deeds of nursing. I cannot say so much, however, of the generality of our volunteer female nurses. I think they are a nuisance, and one that ought to be abated instantly. It is the opinion of the Army Surgeons also. Many of them are very excellent women, but such as are, seldom retain their excellencies. I think a female to go into the wards of an [sic] hospital as a common nurse, is sadly out of place; and if she has not already lost her womanly delicacy, will not be long in doing so....

I found the wards there supplied mainly by volunteer Surgeons, and the care, skill and humanity showed by them in their duties is worthy of all praise.[6]

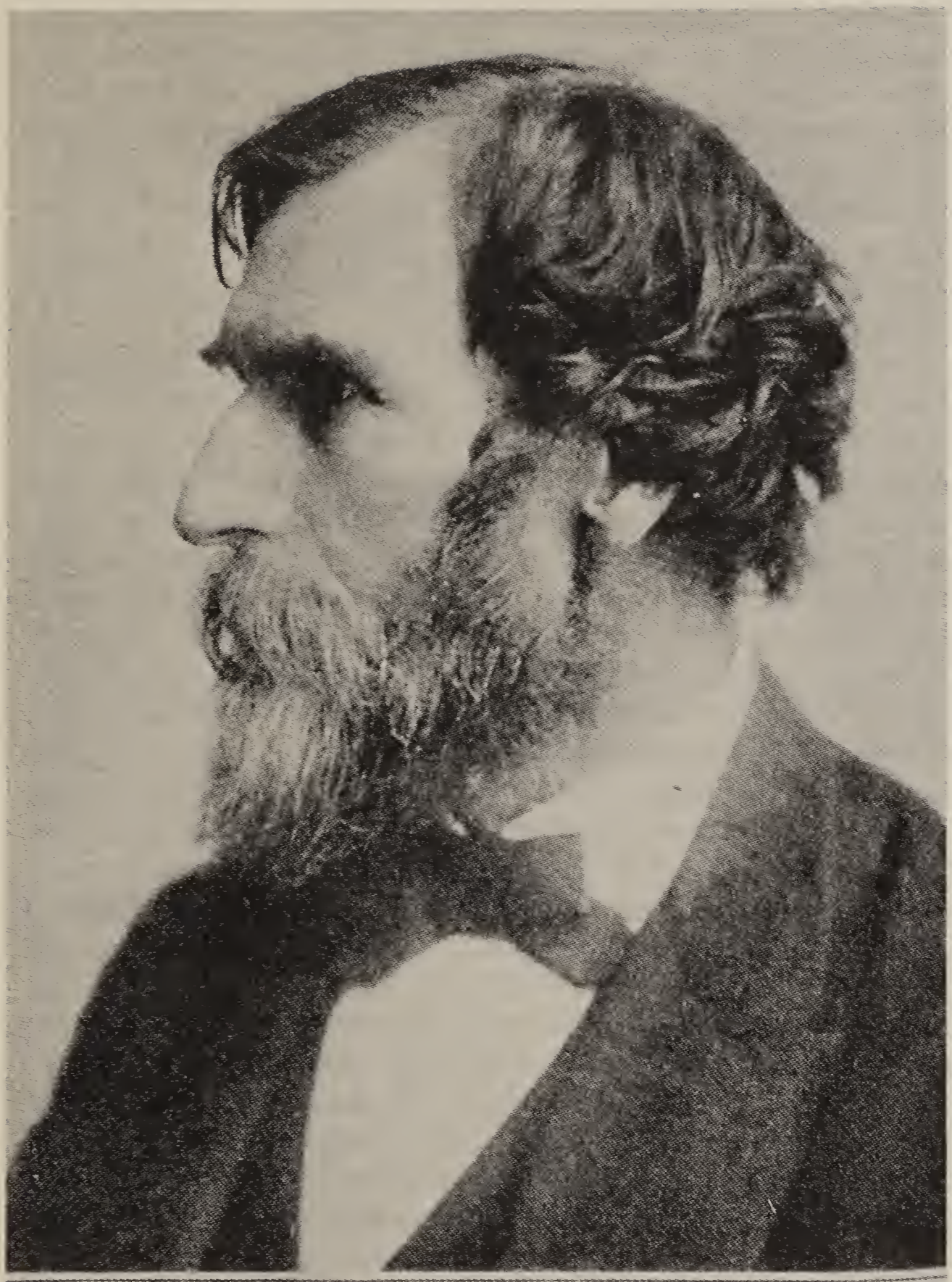
I found the wards there supplied mainly by volunteer Surgeons, and the care, skill and humanity showed by them in their duties is worthy of all praise.[6]

Dr. Rea also went with the Chicago Sanitary Commission to help with the wounded after the Battle of Shiloh. On this trip he saw a different aspect of nursing care than on his previous trip. He reported as follows:

> Miss Safford embodies my idea of what a female should do and be, to accomplish her mission as an assistant to care for wounded men. She is active, kind, sympathizing, disinterested, prudent and indefatigable. She came aboard our boat, and we entrusted her with our cookery. It was a most trying place to come, where there was nothing, and organize and set in motion the machinery that should supply the hungry wants of three hundred, and diversify it to suit the capricious appetites of sick men. So well did she succeed, that our men had the next meal after she came on board at meal time. And so from day to day, everything worked by her management smoothly and perfectly, and it seemed the crowning glory of our mission to see this difficult part of hospital service so admirably rendered. I regard her as the Florence Nightingale of this war.[7]

The large general hospitals such as that located at Mound City, to which most of the Illinois wounded men were returned, were built theoretically to care for the wounded of their area. In reality this plan did not work out for a number of reasons, many of them geographic. The Eastern seaboard hospitals were overfilled as soon as they were opened, so their patients had to be diverted to other hospitals. The troops from the Midwest fought their hardest battles in the far south and the wounded were seldom able to be moved nearer home until they were ready for discharge. Some of the general hospitals were converted to specialty hospitals; for example, the Chicago Eye Hospital came into being at this time. Another factor was the overburdened transportation system, which finally resulted in the patients being taken to any available hospital.

The management of these hospitals was left to the commanding officer, subject to the control of the surgeon general and the general of the military district. Under a regular medical corps officer strict military discipline



EDWARD LORENZO HOLMES

Fig. 25. Edward Lorenzo Holmes (1828-1899). (Photograph reproduced from History of Medicine and Surgery and Physicians and Surgeons of Chicago. *The Biographical Publishing Corporation, Chicago, 1922, with the permission of the Library of Rush University.)*

prevailed. If a local surgeon was in charge, discipline was diluted by local custom. According to military regulations, the senior surgeon saw that the hospital was clean, well ventilated and uncrowded. He had two assistant surgeons, one responsible for records and the other for equipment. Internal administration varied widely and what system there was is said to have been brought about by the National Sanitary Commission's inspectors rather than by those of the United States Medical Department.

A ward physician usually had 75 to 100 patients. Sometimes there was a chaplain for a ward. If the hospital was in a city with a medical school, a handful of students serving as military cadets dressed wounds and made themselves useful.[8] The focal point of the day was the morning visit of the ward physician. As he entered, he was met by the ward master. Every patient able to stand was expected to leap to his feet and salute. Two rows of beds, two beds between each window placed four feet apart, extended the length of the room. The beds were lightweight iron with wooden slats or sometimes folding wooden cots with canvas covers. Accompanied by a nurse and the ward master, the surgeon would move from man to man, examining wounds, changing dressings, prescribing drugs and adjustments in diet. The surgeon was aided by record cards. Each patient wore on his chest a tag bearing his name, rank and unit. At the foot of each bed were two cards: one indicated the diet prescribed and the other recorded the diagnosis.[9]

As the rounds of a ward surgeon highlighted the day, so the inspection tour by the senior surgeon dominated the week. It usually took place on Sunday, making it inevitable that Saturday was clean-up day. On this inspection patients were allowed to voice their complaints. Most of the complaints were about food. Diets were prescribed as shown at right.

Such a diet made complaints inevitable, but there were many compensatory factors. Hospitals near rural areas had a wider variety of food. Some hospitals even planted their own gardens. The diets were also supplemented by the foods supplied by the Chicago Sanitary Commission and the Christian Commission. Local women supplied home-canned fruit and tomatoes, while families and friends brought individual patients their favorite foods and delicacies.

Although hospital medicine might have been described as a

Full Diet	Half Diet	Low Diet
Breakfast	Breakfast	Breakfast
Coffee	Coffee	Coffee or tea
Cold meat	Bread	Bread or toast
Bread	Butter	Butter
Dinner	Dinner	Dinner
Pork and beans	Mutton soup and meat	Farina gruel
Bread pudding	Boiled potatoes	Bread
	Bread	
Supper	Supper	Supper
Tea with milk	Tea with milk	Tea or cocoa
Bread and butter	Bread and butter	Bread or toast
		Butter[10]

hodge-podge, nursing care was a patchwork. Prior to the Civil War there had been no professional nurses. With the declaration of war, though, women volunteered in hordes for service. As the president of the National Sanitary Commission described it, the month of April, 1861 "was distinguished not more by the universal springing of the grass, than by the uprising of the women of the land."[11] To put these women to effective use in the hospitals required special experience and understanding. So when Dorothea Dix appeared in the War Office on April 19 she was regarded as having been sent from heaven. This renowned founder of the first insane asylum in the United States had also visited the hospitals supervised by Florence Nightingale during the Crimean War and was acquainted with the work of the British Sanitary Commission. Miss Dix was accepted immediately by the War Office and became Superintendent of Female Nurses. It was left to Congress to make "female" nurses legal and to provide for their pay. In August a Congressional act provided that women might be substituted for men in general or permanent hospitals when it seemed desirable to the Surgeon General or the surgeon in charge. The salary was set at forty cents a day and one ration.[12]

Unfortunately Dorothea Dix functioned better as a reformer than as an adminstrator. When her system became bogged down in detail and criticism, a government general order

resulted in the hiring of nurses coming under the control of the surgeon in charge. Prior to this order, Dorothea Dix had refused to appoint a Catholic woman "if a Protestant could be substituted." Nuns, however, had been serving as nurses in the West and by the fall of 1861 groups from convents in Indiana and Michigan had taken over the nursing in the hospitals at Cairo and Paducah. In 1862 they had replaced lay women nurses in the large general hospitals at Mound City, Illinois and at Memphis, Tennessee. The soldiers commonly referred to all these women as "Sisters of Charity," but in fact three other orders participated: the Sisters of Mercy, Sisters of St. Joseph and Sisters of the Holy Cross. Most surgeons preferred the nuns as nurses because they had been trained to "perfect obedience."[13]

In 1865 with Sherman's March to the sea and Grant's entry into Richmond, the war was drawing to a close. Tension and anxieties rose with the desire to have the struggle finished. On April 15 came the sad news that Lincoln had been assassinated. Throughout the North there was desolation of losing a leader, but in Illinois it was also the sadness of losing a friend. When the train bearing Lincoln's body came to Chicago on May 1, it was met by a huge and mournful crowd.

The joy engendered by the surrender at Appomattox was diminished by the sorrow of Lincoln's death and by a knowledge of the effort that reconciliation was going to demand. Troops came home relatively rapidly; the sick and wounded more slowly. When the prison camps were emptied, each prisoner had to find his own way home, a slow and often arduous process.

The Civil War resulted in a half million deaths, a third of these from wounds and injuries and two-thirds from contagious disease and other illnesses. The death rate was slightly lower than in the Mexican War or the Crimean War. At this terrible cost in lives and illness, the physicians and the people of the United States learned the importance of sanitation; any soldier or orderly could see that cleanliness in camps and hospitals made a difference. The discovery of the causes of infection lay still in the future with Pasteur, Lister and many other scientists, but sanitation as a method of disease control had become evident. It served as a starting point for the crusades in public health and civilian sanitation that abounded in the last half of the nineteenth century. Military medicine developed

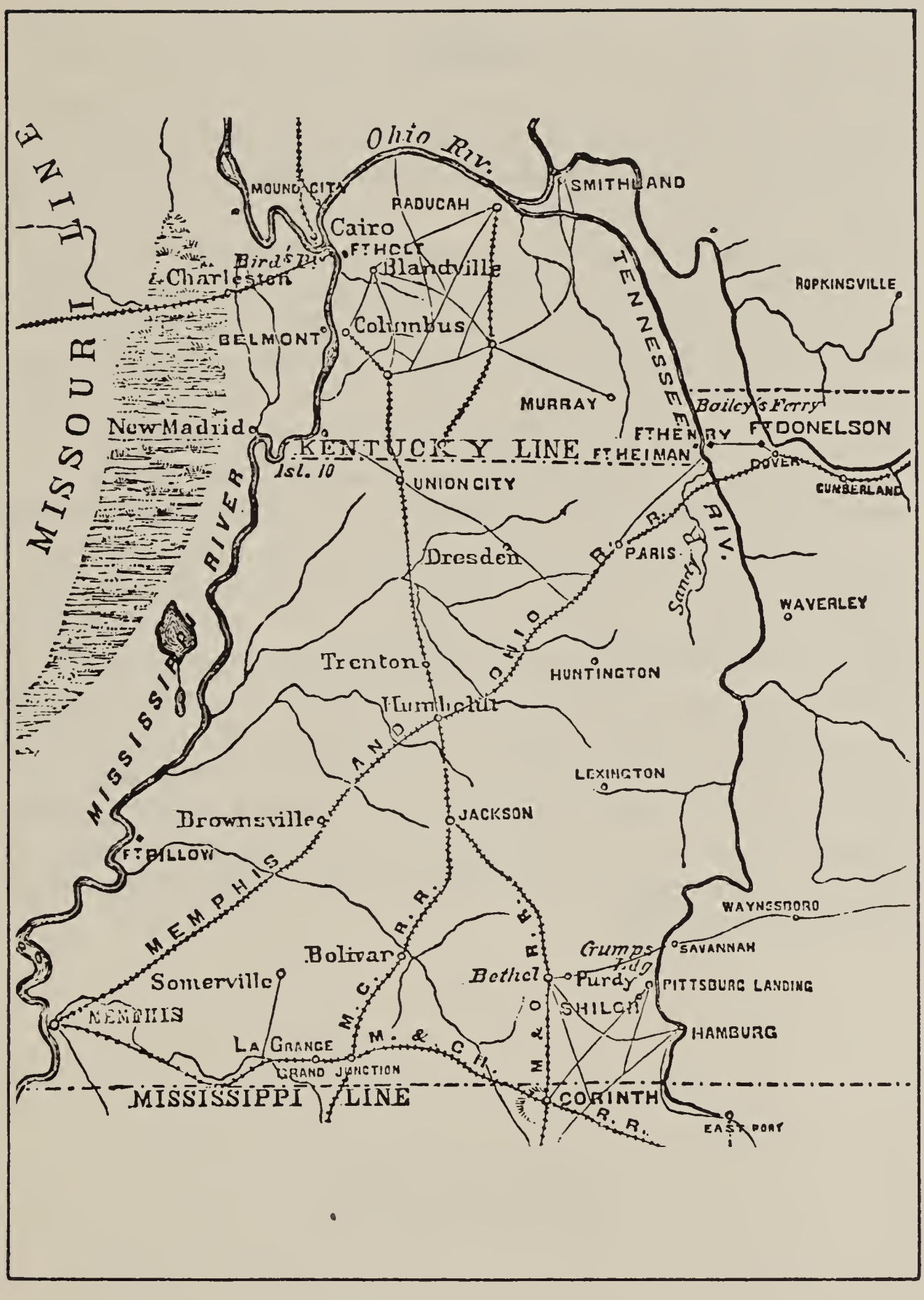


Fig. 26. Fort Donelson map of the field of operation. (From Medical and Surgical History of the War of *the Rebellion (1861-1865). Washington, Government Printing Office. Second issue, 1875, page 25, with the permission of the Library of Rush University.)*

ambulance service, triage, field and base hospitals. Medical knowledge progressed in the field of peripheral nerve injury. The medical history of the war, the foundation of the Surgeon General's library (later to become the National Library of Medicine), and the establishment of the pathology museum all resulted from the Civil War.

To Brainard the Civil War had been a waiting war, one spent in a crowded routine of more medical work, more teaching responsiblity, more civic responsibility, while all the time he waited for but did not receive a call to head a large surgical hospital. With truthfulness unhampered by modesty, he felt that he was better able to handle the problems of amputation, the treatment of compound fractures, and plastic repairs than were most surgeons in the United States. Not getting the kind of appointment he desired was a blow to his pride and to his sense of usefulness. Now he was tired much of the time. He debated whether it was the fatigue of work, an undiagnosed illness, or the frustration of not having been at the center of action. In this emotional turmoil, he decided to go abroad and to take sufficient time to find himself and to get to know his family. He sent his family ahead to Paris so that they could become more familiar with the French language. He himself planned to leave after the first of the year, when the school had settled into its routine, and to stay abroad until the beginning of school the next fall.

Notes

1. George Worthington Adams, *Doctors in Blue: The Medical History of the Union Army in the Civil War* (New York: Henry Schuman, c1952), 4-6.
2. The *National Cyclopaedia of American Biography,* (Ann Arbor, Michigan: University Microfilms, 1967), *20*:309.
3. Bessie Louis Pierce, *A History of Chicago: From Town to City, 1848-1871,* (Chicago: University of Chicago Press, c1940), *2*:259, footnote 50.
4. Adams, *Doctors in Blue,* 31-32.
5. *Nineteenth Announcement of Rush Medical College, For the Session of l861-62, With Catalogue of Previous Session* (Chicago: William Pigott, 1861), 16.
6. "Fort Donelson," *Chicago Medical Journal 5* (April 1862): 195-209.
7. "Pittsburg Landing," *Chicago Medical Journal 5* (May, 1862): 278.
8. Adams, *Doctors in Blue,* 158-159.
9. *Ibid.*, 161.
10. *Ibid.*, 165.
11. *Ibid.*, 176.
12. *Ibid.*, 176.
13. *Ibid.*, 184.

Chapter X
Journey's End

After the Christmas holiday Rush Medical College announced that Brainard would be leaving for Europe and that his classes would be given by his nephew, Dr. Edwin Powell. Upon receiving this news, the students called a meeting and unanimously adopted the resolutions, quoted in full below:

LECTURE ROOM RUSH MEDICAL COLLEGE
December 26th, 1865.

WHEREAS, Having been informed of the purpose of our honored President and Professor of Surgery—Dr. Brainard—to depart soon for Europe, upon a visit of scientific research, and for the restoration of his health; And whereas, the Students of Rush Medical College feel a lively interest in the welfare and prosperity of their distinguished teacher, therefore be it

Resolved, That the members of this class do hereby tender to Prof. Brainard their unfeigned regards, with their best wishes for a safe and prosperous passage to the old world, where, temporarily relieved from the arduous duties of the profession he has so long adorned, he may find such quiet and comfort as will speedily and completely restore his health,

partially deranged during his long continued services, faithfully performed, in the advancement of science.

Resolved, That while we sincerely regret the necessity of his departure before the expiration of his present collegiate term, we do cheerfully submit to our present loss, believing that the profession at large will be benefited—no little—by his dipping pens, and comparing notes with the medical savans [sic] of the east—the Philosophers of the Old World.

Resolved, That while we invoke all the pleasures and benefits to be derived from a sojourn with his trans-Atlantic friends and admirers, we do most humbly petition for the Doctor a safe and pleasant "homeward-bound," where, again arrived, he may—by the providence of God—live long to enjoy the fruits of his attainments in that profession which is proud to acknowledge him as one of its bright and leading men.

Resolved, That a copy of these proceedings be presented to Professor Brainard, and that copies be furnished THE CHICAGO MEDICAL JOURNAL and city press for publication.

JNO. W. CRAIG.
M. P. SIGWORTH
N. T. QUALES
G. M. CHAMBERLIN,
C. F. KNAPP,

Committee on Resolutions.

Unanimously adopted.

J. B. EGBERT, *President.*
W. W. MURRAY, *Secretary*[1]

* * *

Brainard, touched by the care and affection of his students, replied on the next day:

CHICAGO, Dec. 27th, 1865.

To Messrs, Jno. W. Craig, M. P. Sigworth, N. T. Quales, G. M. Chamberlin, C. F. Knapp, Committee of the Class of Rush Medical College.

GENTLEMEN:

I beg you to convey to the class my heartfelt thanks for the kind and too flattering resolutions which they adopted and presented to me.

My interest in the institution with which we are all connected, is unabated, and must remain so as long as I live.

It will, therefore, be my pleasure as well as my duty, to resume, at the commencement of the next course of lectures, my position as a teacher in Rush Medical College.

Please convey to the members of the class, gentlemen, my grateful acknowledgments for their kindness, and my warmest wishes for the welfare of each one of them. Accept, also, for yourselves, the thanks and kind wishes with which I shall ever remain,

Yours most truly,
DANIEL BRAINARD,
Pres. and Prof. of Surgery in Rush Med. College.[2]

The *Chicago Medical Journal* noted that "when he left, the class of students which he has instructed this winter, marched in procession to the train in which he took his departure, to offer to him their parting salutation, and as a token of their respect, attachment and esteem."[3]

One of the students, J. Knowles, who participated in this event, described it movingly: "The class all went to the old Union Depot to bid him good-bye. After we had all lined up he came along and took each one by the hand but did not say anything. The last I saw of Daniel Brainard he was standing on the car platform waveing [sic] his handkerchief with the tears running down his rugged face."[4]

Fig. 27. Nathan Smith Davis (1817-1904). (From Physicians and Surgeons of Chicago *compiled by F.M. Sperry, Chicago, J.H. Beers & Co., 1904, page 1, with the permission of the Library of Rush University.)*

The day after his arrival in New York Brainard boarded ship for France. He had always enjoyed ocean voyages because they were the only periods of his adult life when he was free of professional duties. In any state of limbo, reverie slips into review and self-evaluation. Brainard thought first of the medical school—the excitement of its founding, the satisfaction of its growth, the strife of its civil war, and the triumph of its survival. He had enjoyed his students and taken great pride in the development of young surgeons. When he thought of his own career as a surgeon, he was much more critical. He considered himself a good but not a brilliant operator. He took satisfaction in having accepted and used the new advances like the stethescope and anesthesia. From now on, though, Brainard was going to concentrate his energies on the science of surgery. He was planning a book that he called an "atlas of surgery," but it was going to be like no other atlas. It would tell surgeons not only the "how's" but also the "why's." Secretly he had packed his preliminary sketches beneath his starched white shirts on the bottom of his portmanteau. He looked forward to discussing his book with Velpeau, whose work and writing he admired, and with the publisher Bailliere, whose editing of scientific books he thought unequalled.

Turning from his professional life to his personal life was disturbing. Never having been able to face the fear and helplessness that he had experienced with the illness and death of his first son, Daniel had buried the memories and the emotions. Although this strategm had failed, he turned to it again when the death of his third son brought back his despair at his loss and his fear for his remaining son and daughter. Resisting any outward signs of affection left fewer chinks in the armor of his reserve, but had lost him any closeness with his son and daughter. His wife could be more understanding of his withdrawal, but understanding made her no less lonely. He had secret hopes that this journey could bring them all closer together.

Brainard also thought about the problem of his health and remembered an adage of his favorite teacher: "A physician who takes care of himself has a fool for his doctor." Since in this matter, at least, he could take action, he vowed that he would see a physician in Paris. Soon after his arrival Brainard arranged an appointment with Armand Trousseau, the great

clinician of Hôtel Dieu.[5] Although selection of Trousseau was his own decision, it had been influenced by Alfred Velpeau, the surgeon whom he most admired. Velpeau and Trousseau had been close friends since student days when they had studied in Tours under Pierre Bretonneau. All three men—Brainard, Velpeau and Trousseau—had much in common. They had grown up in small towns, gone to small but good medical schools, been very fortunate in their teachers, and made their respective ways in great cities.

When Brainard went to keep his appointment he was fearful, but the kindliness and interest that Trousseau manifested while taking his medical history disarmed him. After a very thorough physical examination, Trousseau, well aware of a surgeon's need to visualize a concept, showed him his urinary tests and demonstrated crystals that precipitated and redissolved. Then they went into the consultation room, where Trousseau told him that he had chronic renal disease and that the crystals that he had seen were oxalates. When Brainard reported to his friends, he said that he "had a functional derangement of the kidneys diagnosticated by Trousseau and other distinguished professors in Europe as oxaluria."[6] Trousseau complimented him on having initiated a change of airs and probably gave him the usual advice—to omit rhubarb tarts and sorrel as foods high in oxalic acid, to avoid the cold Chicago winters and to dress warmly, especially about the loins, and to make sure that his buggy had good springs in order to avoid jarring his kidneys.[7] Trousseau ended the consultation by urging him to press on with his surgical book.

Brainard was much encouraged, expressing his relief about his physical status by showing his wife and children all of his favorite places in Paris. The four of them started planning their itinerary in Italy; Brainard wrote home that they planned to spend a couple of months there.[8] On February 5, the Brainards took a train to Marseilles and enjoyed the warmer weather as they neared the Mediterranean coast. Then there was the adventure of boarding the boat, and finally the Bay of Naples, with Vesuvius looming in the background. Although the city was still a customary stop on a grand tour, it was no longer as popular as it had been several decades earlier. When in 1860 Garibaldi defeated the last Bourbon king, Francis II, Naples had become a part of Italy. Many foreigners considered

this occurrence to have resulted in a less than politically stable arrangement and consequently shortened their visits. The Brainards soon made friends among the other guests in their hotel, which had been recommended by English tourists, and enjoyed the opera and the art exhibits, especially the sculpture.

Brainard, even though on vacation, was drawn to the sciences. Geology had always been a special interest and he found Vesuvius fascinating in itself and its history. Also he and his son took the fifteen-mile trip to Pompeii. Although there had been some excavations there since 1748, it was only in 1860 that Guiseppe Fiorelli had adopted a systematic approach to the excavations, and this approach Brainard found intriguing. He took a real pleasure in deciphering the Latin inscriptions. It somehow made up for his inability to speak Italian and for the fact that his French had not been as helpful as he had hoped it would be.

By May they had reached Rome, where spring had softened the ruins with flowering shrubs and clinging vines, and where the hubbub of the Naples waterfront was replaced by the gas-lit Via Veneto. The family stayed in a well-recommended English hotel with its rather dreary cuisine, but Brainard had worked out a brisk tourist plan. They visited the Vatican, where they were awed by the Sistine Chapel. They admired the piazzas with their sculpture and fountains. Still, it was the Roman ruins that spoke to Brainard. He had always enjoyed Livy's histories, but now he felt that he walked with the ancient scholar through the Coliseum and passed the columns of Trajan and Marcus Aurelius.

Then it was on to Venice, which the children particularly enjoyed; they were not alone in their enjoyment—the parents also loved the gondolas, the shadowy palaces, the paintings, the pleasure of sitting in the San Marco Square at dusk.

By this time Brainard was impatient for medical contacts, so he and his family moved on to Geneva, Switzerland. Years before, on his second trip to Europe, he had been elected an honorary member of the Medical Society of the Canton of Geneva by his student friends from that city,[9] and through the intervening years he had maintained these friendships. Since Geneva was French-speaking, communication was possible. Brainard sought out his old friends and found them delighted and delightful. The Brainards were invited to various homes,

and while the older generation renewed former friendships, the younger generation made new friends. Brainard went to lectures, to the hospitals, and to medical society meetings. He felt at home in the medical atmosphere, and even the countryside reminded him of the lake country of his home state of New York.

In August the Brainards were back in Paris, looking for an apartment and making school arangements for lessons for Julia and Robert. The *Chicago Medical Journal* noted that "from a letter to a friend, we learn that Prof. Brainard has already engaged passage by the steamer which will sail from Havre on the 30th of August, and may be expected in Chicago the latter part of September."[10] His family remained behind in Paris to await his return.

On his way to Chicago, Brainard "spent a day in Rome, N. Y., with his life-long friend, Mr. Comstock, pleasantly recounting the incidents of his foreign travel, expressing the greatest interest in the prosecution of his work connected with the lectures in the College, and anticipating a return to Europe for a third [sic] visit with a view to a still more extended course of investigations."[11]

When he arrived in Chicago on September 21, Brainard took a room at the Sherman House rather than opening his home, where he felt that he would be lonely without his family. He visited his office which Dr. Freer had manned in his absence. He called on his friends, inspected the school, and made the rounds of his patients. Then came the shock of finding that cholera was also making its rounds. This disease, feared throughout the world, had always evoked a peculiar horror in Chicago, arising from the experiences and memories of the epidemic of 1832-33.

The spring of 1832 had brought the return of the Sauk and Fox Indians under the leadership of Black Hawk. They raided two small settlements and a single farm, but rumor and fear spread widely and quickly throughout the area. Many settlers fled to Fort Dearborn, Chicago, although it offered little protection since its garrison had been moved to Green Bay, Wisconsin. The shelter provided was very crowded. Each barrack cubicle which had housed a single soldier was now bursting with a family. So the fort proved an even more fertile ground for the spread of rumor and fear than had the

countryside.

Meanwhile the War Department became alarmed at the Black Hawk War and decided to replace the Fort Dearborn garrison. On June 16 Major William Whistler arrived with two companies of regulars from Fort Niagara, and General Scott was ordered to reassemble the garrisons from the Great Lakes and conduct them to the seat of the war. Unknown to the War Department, a far more serious enemy—cholera—was invading the East coast ports. General Scott, then in New York, was aware of this problem and consulted his private physician, Dr. Mower, for advice. Although what he learned was not encouraging, Scott decided to board his flagship, the *Sheldon Thompson.* There were three other ships in his convoy: the *Superior*, the *William Penn* and the *Henry Clay.* Aboard the *Henry Clay* was a sailor with cholera. The *Henry Clay* was ordered to Belle Isle, but by the time the ship reached the island so many men were dead or dying that the crew refused to continue the journey. Colonel Twigg, the commanding officer, disembarked what men he had left and two-thirds of them fled. On the *Superior* the men mutinied when the epidemic broke out. The *William Penn* returned to Detroit.

The *Sheldon Thompson* sailed on, and it was not until it reached Lake Michigan that cholera struck. The only surgeon on board became panic-stricken, drank a bottle of wine and took to bed where, to quote the disgusted commander, "he ought to have died."[12] In this emergency Scott himself turned physician and set an example by exhibiting no sign of fear. Years later he told John Wentworth that although he had often been in the midst of suffering and peril, he had never felt entire helplessness as he did upon the lake in the midst of Asiatic cholera: "Sentinels were of no use in warning of the enemy's approach. He could not storm his works, fortify against him, nor cut his way out . . . and his men were falling upon all sides from an enemy in their midst."[13]

The ship reached Chicago on July 10, 1832. On the two-day voyage across Lake Michigan sixteen soldiers had died. During the night which elapsed between the arrival in Chicago and the landing of the soldiers, three more men died and were thrown overboard. Years later the ship's captain recalled that in the morning the faces were still visible in the water, and to escape the grim sight he shifted to another location before unloading.

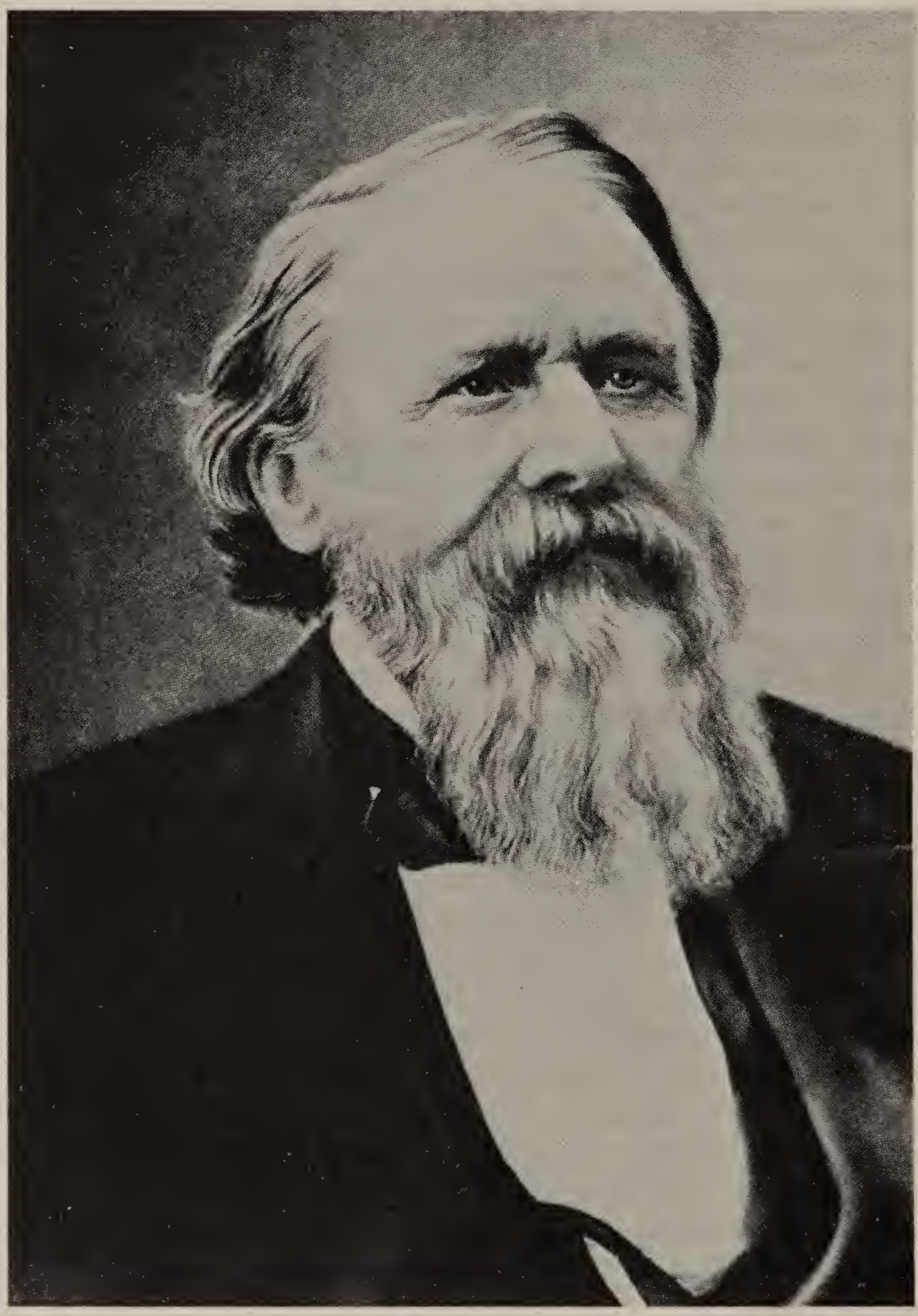


Fig. 28. John Evans (1814-1897). (From Life of Governor Evans *by Edgar Carlisle McMechen, 1924, page 2, with permission of the Library of Rush University.)*

Ashore, the troops occupying Fort Dearborn were moved to an open camp and the fort was converted into a general hospital. By July 12 there were seventy-seven cases of cholera and twenty-five deaths. The epidemic raged on, with a total of two hundred men falling ill and fifty-eight dying. It was a week of utter chaos. So it was no wonder that the mention of cholera evoked nightmarish scenes of death in the hospital, crowded rows of patients in tents on the fort grounds and dead bodies rising eerily in the water.

Added to the old memories was the new hypnotic effect of tracing in newspapers and medical journals the slow, relentless progress of the cholera epidemic as it spread from the banks of the Ganges, through the Middle East, through the Near East, to Egypt, to Italy, to France and then to England. For example, in January, 1866, Chicago physicians were reading of the cases of cholera that had occurred the previous September and October in Marseilles. These cases were first noted in a paper by M. Grimaud, delivered to the Academy of Science in Paris, abstracted in the *Boston Medical and Surgical Journal* and then reprinted in the *Chicago Medical Journal.* The author summarized succinctly: "The cholera travels with men and with things."[14] In February those doctors who had not heard Dr. J. Adams Allen's valedictory address to the Rush Medical College senior class read it in the *Chicago Medical Journal.* It contained the following admonition: "We send you to the fore front of the conflict with disease and ignorance. We know you will not skulk when cholera or other pestilence comes; and we believe that in the more constant and sterner battle with ignorance you will provide no cowards. For these life struggles we bid you Farewell."[15]

In March the Chicago Medical Society resumed its discussion of cholera, led by Dr. Nathan Smith Davis, who

> . . . stated very clearly the effects of caloric upon the vital affinity of the tissues of the body, producing a laxity of tissue and a sluggish performance of the processes of nutrition and secretion which favor the invasion of disease. Added to these predisposing causes, is either the absence or the presence of something in the air, which by its action upon the excito-vascular nerves depresses their vitality, so

> that they cease to maintain that degree of vascular tonicity which is essential to health. Hence, exudation occurs in the form of perspiration upon the surface of the body, and in the form of a flux upon the mucous surface of the alimentary canal. As the disease advances the blood is drained of its watery portion until it becomes too thick to circulate, and the phenomena of collapse ensue.[16]

Although the clarity of this statement was not apparent its verbosity was comforting.

Dr. Henry Lyman addressed the society in support of the theory that cholera was a result of morbid change produced in the watery portions of the blood. He presented a table of more than six thousand cases of cholera treated in the hospitals of London and Paris, from which he sadly concluded that it appeared to him that the percentage of mortality increased in exact proportion to the activity of the efforts made to counteract the phenomena of the disease.[17] In defense of the statistics produced by Dr. Lyman, Dr. Eugene Marguerat stated that they were of the most trustworthy character, having been taken from hospital records. The statistics most favorable to the proposed method of treatment by weak saline solutions administered freely with cold water were obtained from the Greville Street Hospital in London, a cholera hospital where the worst forms of the disease were subjected to this treatment with the remarkable result of only 19 per cent of deaths.[18] A resurrected form of this treatment is used today. In July the *Chicago Medical Journal* editorialized: "As the season of vile odors and foul miasms [sic] is opening upon us with a dark cloud of cholera glooming in the horizon, the question of disinfectants assumes more than ordinary interest."[19]

Finally on August 6 it happened—the first diagnosed case of cholera was admitted to the county hospital. The patient, an emigrant from Denmark, had become ill while traveling west on a Mormon train, been abandoned at the Chicago railroad depot, and then brought to the county hospital. The rest of his story was recorded by Thomas Bevan, physician at the county hospital. The patient slipped rapidly from peripheral vascular collapse into coma, and then to death on the following day. After two days of ominous quiet a nurse who had taken care of

the patient became ill with nausea, vomiting and diarrhoea, and becoming progressively more dehydrated and cyanotic, died in twenty-four hours. On the same day that the nurse became ill a patient who had been in the hospital for six months being treated for lupus became ill with diarrhoea, which grew more severe with rice water stools, increasing weakness and cramps. After a week he made a slow recovery.

On August 10 a patient who had been admitted on the same day as the first patient and had occupied the bed next to him was attacked by the same symptoms. He failed to respond to treatment and died in forty-eight hours. On August 11 a post partum patient recovering from toxemia became ill with the dread symptoms but two days later was convalescing. On August 12 the Irish washer woman of the hospital became ill but she, too, made a good recovery.

On August 13 the seventeen-year-old daughter of the hospital warden fell ill. Dr. Bevan described her symptoms very vividly:

> . . . About 2 P. M., however, cramps and vomiting set in, and soon became something *terrific*—utterly beyond description. It seemed as if every part of the organism capable of contraction was the subject of spasm, including the diaphragm and glottis, interrupting respiration, at times, from ten to fifteen seconds, and ending with a slow whistling inspiration of almost equal duration.[20]

After forty-eight critical hours, the girl began to improve and then made a rapid convalescence. There were another twelve cases, for a total of nineteen.

Dr. Bevan concluded his study with these remarks:

> . . . In addition to the above cases, the Warden of the Hospital and the Resident Physician had distinctly marked choleraic attacks, but recovered. The precautions taken, and the prophylaxis employed, were isolation of the patients, disinfection of the discharges, cleanliness and free ventilation. The epidemic lasted fourteen days. The mortality

> among the paupers attacked was as 1 to 2, or 50 per cent; while the mortality among the nurses and officials of the Hospital was as 1 to five, or 20 per cent. So true is it that pestilential diseases ravage the poor, ill-fed and ill-clothed wrecks of humanity which find their way to a public hospital, that, but for the striking difference noted above the fact would scarcely need mention; and here let me note the fact, that the cases which occurred among the better class of patients were as violent, if not *more violent*, than among the paupers, yet the former would react and convalesce, while the latter quickly succumbed.[21]

In August following the initial case noted in Dr. Bevan's report there were 133 more deaths from cholera and 15 from cholera morbus. When Brainard returned in late September, there had been 272 deaths from cholera in Chicago in that month. No one could question that the city was in the midst of an epidemic. Some physicians, among them Nathan Smith Davis, were cheered by the fact that there had been only a small number of deaths of native-born Americans, while the majority of deaths had occurred in the immigrant population. Country of origin was not included in all the reports but the figures for September were U. S. nativity 33, German 110, Irish 66.[22] Case incidence tapered off at the end of September, only to rise rapidly after the first week of October. In October there were 673 deaths from cholera, 15 deaths from cholera morbus and 9 deaths from cholera infantum. By November the death rate had dropped to twelve deaths from cholera, four from cholera morbus, and one from cholera infantum.

In spite of the epidemic, school opened on October 3 with full attendance and a commencement address by Dr. Freer. On October 9 Dr. Brainard gave his initial surgery lecture but deviated from his regular plan in order to discuss the cholera epidemic. He spent most of that evening at his office visiting with friends, and then returned to his room at the Sherman House. He wrote a few notes for his next surgery lecture that dealt with avoiding infection with cholera:

> . . . He retired at 11 o'clock with every appearance of perfect health. During the latter part of the night he had an attack of diarrhoea, which he checked by an enema of vinegar of opium. He arose the following morning and partially completed his toilette, read the morning paper, and commented on the election news—the only indication of illness being a light moisture of the skin, which he attributed to the opium taken during the night. He took a bowl of chicken broth for breakfast, and remained comfortable until about 9 o'clock, when he was seized with a most violent paroxysm of vomiting, followed soon after by a return of diarrhoea, both of which continued at short intervals for about two hours, when they entirely ceased. During that time he sank rapidly, and by 2 o'clock was in profound collapse.[23]

Daniel Brainard ceased to breathe at 9:15 p.m. on October 10, 1866. His death came very quickly because of his underlying renal disease.

The next day was dark and gloomy; the epidemic continued unabated. Ensigns of mourning hung over most of the civic buildings in memory of those officers of the city government whom the pestilence had stricken. At noon on October 11 there was a meeting of the faculty of Rush Medical College to receive the announcement of the death of Daniel Brainard. The frightened students gathered in small groups in the halls, repeating the few facts and the far more numerous rumors. They petitioned the faculty to dismiss school until December but were dissuaded from this course and classes continued.

At four o'clock in the afternoon there was a meeting of members of the medical profession. Brock McVickars paid tribute and asked for resolutions. A committee of Dr. R. C. Hamill, Dr. H. A. Johnson, Dr. J. V. Z. Blaney, Dr. N. S. Davis and Dr. DeLaskie Miller was appointed to procure a marble bust and some other permanent memorial. Dr. Powell, the nephew of Dr. Brainard, asked that the group select six of the pallbearers, and Drs. Hitchcock, Duck, Eldridge, Hamill, Paoli and Johnson were selected. At a meeting of particular friends a group of distinguished citizens were also selected as pallbearers: the mayor of Chicago, J. B. Rice; Hon. Charles

Walker; Hon. J. Young Scammon; John L. Wilson, Esq.; Dr. C. V. Dyer; and Julian S. Rumnsey, Esq.[24]

On the following day the friends of Brainard met at the home of Colonel J. H. Bowen and then proceeded to St. James Church. At 11 o'clock the coffin was taken from the funeral car by the pallbearers and carried into the church. On the porch stood ladies, each with a floral wreath or immortelle which they placed upon the bier as it passed. The coffin was borne to the front of the altar, followed by the members of the medical profession and the students of the college. After the prayers and the reading of the Scriptures, the Reverend Clinton Locke delivered the funeral discourse which included these remarks:

> . . . He was not, what I wish I could say of him, a devout Christian, but he was no disregarder of religion, no scoffer at its doctrines, and he was far from having those materialistic views so common with many of his brethren. The Bishop of the Diocese was for years his intimate friend, and my place would have been his if he could have been here.

The Reverend Locke had earlier noted:

> . . . To strangers he may have seemed cold and reserved, but it was because he had no time for trifling. . . . Many a young man among the twelve hundred who have come under his care, knows how freely his purse was open to necessities, for he was a generous cheerful, open-handed giver, and he took above all the greatest delight in helping onward a struggling youth, desirous, and yet pecuniarily unable to acquire the necessary information.[25]

At the conclusion of the address the remains were taken back to the funeral car and the cortege, comprised of about thirty carriages, proceeded to the old City Cemetery, where the rest of the funeral service was read. The coffin was then placed in the vault to await the wishes of the friends of the deceased. His wife and children were still far away in Paris.

Neither Christian charity nor professional ethics inhibited Nathan Davis's comments in the *Chicago Medical Examiner*:

> At the commencement of his professional career [Brainard] took special pains to qualify himself for the practice of surgery, and almost immediately became identified with the establishment of Rush Medical College in this city; the Surgical Chair in which he filled with marked ability until the day before his death [sic]. He was never popular as a general practitioner of medicine, and during the last *ten* years of his life his professional practice was restricted almost exclusively to surgical cases. He was not a showy or brilliant operator, but a deliberate, accurate, and successful surgeon. It was in the lecture-room, however, in his capacity as teacher, that he achieved the highest reputation. Possessed of a mind well stored by reading and observation, and thoroughly disciplined by reflection, his didactic instruction was clear, concise, and impressive; giving him an enviable popularity as a lecturer. In his unofficial capacity, as a member of the profession, Dr. Brainard was not noted for genial affability, scrupulous regard for ethical rules, or cordial cooperation in the support of medical organizations. He was not only studious in everything relating to his favorite department, but he often entered boldly upon original investigations and experiments concerning such topics as strongly attracted his attention. Though he wrote no complete work upon any department of medical science, yet the results of his experiments in the treatment of ununited fractures; on the effects of iodine on the poison of serpents; and on the effects of lactate of iron injected into the veins, in the treatment of the cancerous diathesis, will perpetuate his name on all the future annals of our professional literature. Although the strictly professional income of Dr. Brainard was never large, yet, by some successful real estate operations, he had secured to himself and his family an ample fortune.[26]

There was a meeting of his colleagues on the day after his death, although many of his close friends, such as John Evans,

were too far away to attend. Dr. Brock McVickars paid the following tribute:

> Daniel Brainard was no ordinary man. He was possessed of sterling abilities, quickened and developed by culture and study; of untiring industry; of unremitting perseverance and unflagging zeal in the pursuit of knowledge. He was cold and reticent at times, but what seemed coldness to many was but the absorption of a strong and earnest nature, pressing forward to the attainment of the high mark he had proposed to himself. He had an abiding hatred for pretenders and shams, and looked with little favor upon those who followed their profession without seeking to rise above its daily routine of duties. When once satisfied of a man's integrity, earnestness and intelligent devotion to his profession, he was his friend. With Dr. Brainard, with but slight interruptions, my relations, personal and professional, have always been of the most agreeable character; and at the time of his death, they were particularly so. I shall never forget how, during my last interview with him, a few days since, I was impressed with respect and regard for him as a gentleman, courtly in his manners, polished by foreign travel and culture, the peer of the noblest in the land. His example, Gentlemen, may serve to illumine the pathway of the student, to quicken him to higher and better efforts, and give him assurance of success. . . . Peaceful be his rest, green be the turf which grows above him, and bright be the place which he shall hold in the memory of friends he has left behind.[27]

These were the views of three of Daniel Brainard's contemporaries—a clergyman, an enemy and a friend.

More than a century later, when emotions have calmed, ambitions have died and the search for power has ended, Brainard's life and contributions can be more objectively evaluated. His life was short and stormy, bounded by two wars. He was born in a small and newly formed country beset by the

War of 1812. He died fifty-four years later, following a civil war fought to preserve a nation that now spread from ocean to ocean. He practiced surgery in Chicago, a town built around the ashes of a fort burned in an Indian massacre, which survived to become a trading center for a busy farm community. Then it was hurled into an industrial revolution and became a bustling manufacturing and transportation city. As his country and his city grew, so did he. With practicing and operating, reading and experimenting, teaching and lecturing, writing and editing, traveling and studying abroad, he became the best surgeon of his time in his area and one of the best surgeons in the country.

He founded and guided a medical school to educate physicians to care for people in a pioneer land. Many of his students followed the continuing western migration, even to California, so that the influence of the school spread far beyond its area.

He also had a vision of the science of surgery. He was happiest when he worked on a scientific problem; unfortunately few of his friends or his students shared his enthusiasm for clinical investigation. It was fifty years before an experimental rather than an empirical method would be an accepted approach to surgery.

Brainard was an able surgeon, the founder of Rush Medical School and a visionary scientist whose dream became in time a reality. Were he to have selected his own epitaph, he would probably have chosen his favorite quotation from the surgeon he most admired—Ambroise Paré: "And, notwithstanding all the pains I have heretofore taken, I have reason to praise God, in that it hath pleased Him to call me to that branch of Medical practice, commonly called Surgery, which can neither be bought by gold, nor by silver, but by industry alone, and long experience.[28]

Notes

1. *Chicago Medical Journal 22* (December 1865): 565-566.
2. *Ibid.*, 566-567.
3. *Ibid.*, 565.
4. Letter from L. Knowles (class of 1865-66 and 1868-69) to J. H. Etheridge in Logan, Iowa, dated December 3, 1898. (From Rush-Presbyterian-St. Luke's Medical Center Archives).
5. Fielding H. Garrison, *An Introduction to the History of Medicine*, 3rd ed. (Philadelphia: W. B. Saunders Company, 1924), 565.
6. *Chicago Medical Journal 23* (November 1866): 529.
7. This advice is drawn from a number of sources. See A. Trousseau, *Lectures on Clinical Medicine, Delivered at the Hôtel-Dieu, Paris*, translated from the 1868 edition (London: The New Sydenham Society, 1872), 5: 359-360. See also Thomas Watson, *Lectures on the Principles of Physic: Delivered at King's College, London*, 3rd ed. (Philadelphia: Lea and Blanchard, 1848), 864-866.
8. *Chicago Medical Journal 23* (March 1866): 142.
9. James Nevins Hyde, *Early Medical Chicago: An Historical Sketch of the First Practitioners of Medicine, With the Present Faculties, and Graduates Since Their Organization, of the Medical Colleges of Chicago* (Chicago: Fergus Printing Company, 1879), 29.
10. *Chicago Medical Journal 23* (September 1866): 432.
11. James Nevins Hyde, *Early Medical Chicago*, 29.
12. Milo M. Quaife, *Lake Michigan* (Indianapolis: Bobbs-Merrill Company, 1944), 140-144.
13. *Ibid.*
14. *Chicago Medical Journal 23* (January 1866): 29.
15. *Chicago Medical Journal 23* (February 1866): 62.
16. *Chicago Medical Journal 23* (April 1866): 176.
17. *Ibid.*, 177-179.
18. *Ibid.*, 179.
19. *Chicago Medical Journal 23* (July 1866): 336.
20. *Chicago Medical Journal 23* (October 1866): 455.

21. *Ibid.*, 459.
22. *Chicago Medical Journal 23* (November 1866): 526.
23. *Ibid.*, 529-530.
24. *Ibid.*, 532-534.
25. *Ibid.*, 535-537.
26. *Chicago Medical Examiner 7* (November 1866): 687-688.
27. *Chicago Medical Journal 23* (November 1866): 532-533.
28. American Medical Association, *Transactions 7* (1854): 28.

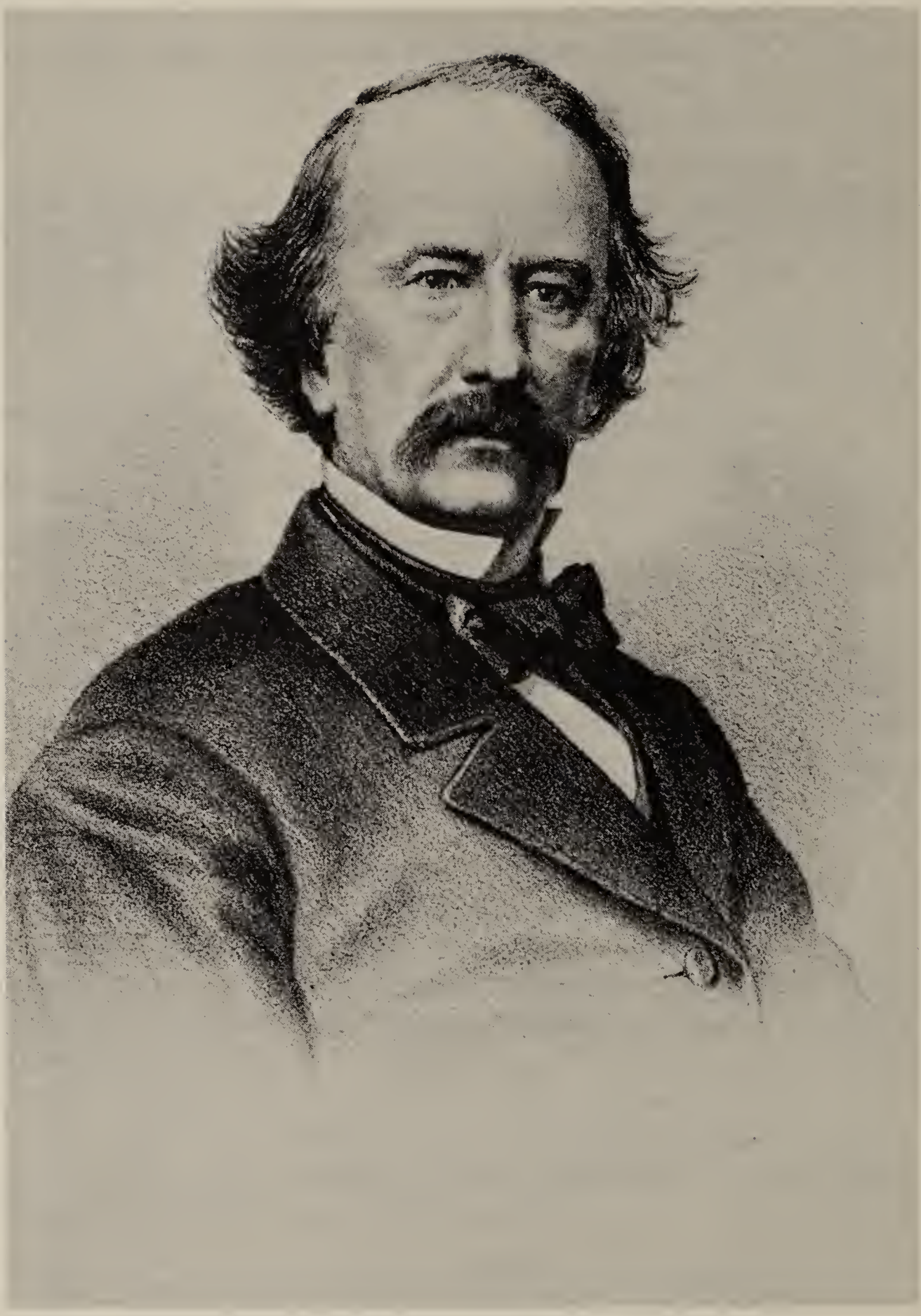


Fig. 29. Daniel Brainard (1812-1866). (From Chicago Medical Journal, *vol. 23, November 1866, facing page 491, with permission of the Library of Rush University.)*

APPENDIX A

SOURCES

The following books and papers formed a valuable historical and biographical background for this book.

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3. MEDICAL EDUCATION IN THE UNITED STATES

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Norwood, William Frederick. *Medical Education in the United States Before the Civil War.* New York: Arno Press and the New York Times, 1971.

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Stewart, F. Campbell. *The Hospitals and Surgeons of Paris: An Historical and Statistical Account of the Civil Hospitals of Paris; With Miscellaneous Information, and Biographical Notices of Some of the Most Eminent of the Living Parisian Surgeons.* New York: J. & H. G. Langley and Philadelphia: Carey & Hart, 1843.

5. CIVIL WAR

Adams, George Worthington. *Doctors In Blue: The Medical History of the Union Army in the Civil War.* New

York: Henry Schuman, 1952.

6. BIOGRAPHIES

Danforth, I. N. *The Life of Nathan Smith Davis.* Chicago: Cleveland Press, 1907.

Gross, Samuel D. *Autobiography of Samuel D. Gross, M.D., With Sketches of His Contemporaries.* Edited by his sons. Vol. 1. Philadelphia: George Barrie, 1887.

McMechen, Edgar Carlisle. *Life of Governor Evans, Second Territorial Governor of Colorado.* Denver: Wahlgreen Publishing Company, 1924.

Scott, Walter Dill. *John Evans, 1814-1897: An Appreciation.* St. Charles, IL: Chronicle Publishing Company, 1939.

APPENDIX B

MAJOR SCIENTIFIC PAPERS

1838 "Amputation at the Hip Joint." *American Journal of the Medical Sciences 22* (August 1838):372-376.

1839 "Character of the Fevers Prevalent at Chicago, Illinois, in 1838, '39." *Medical Examiner 2* (November 9, 1839):714-716.

1843 "Aneurism of the Femoral Artery from Fracture of the Femur at Its Superior Part—Ligature of the External Iliac Artery—Recovery." *American Journal of the Medical Sciences* (N.S.) *6* (October 1843):359-363. Reprinted in *Illinois Medical and Surgical Journal 1* (September 1844):87-92.

"Two Cases of Immobility of the Lower Jaw, Successfully Treated." *American Journal of the Medical Sciences* (N.S.) *6* (October 1843):374-376.

1844 "Two Cases of False Anchylosis Cured by Extension, Without Division of the Tendons, With Some Remarks Upon the Varieties and the Different Modes of Treatment of the Deformity." *Illinois Medical and Surgical Journal 1* (April 1844):4-10.

"Account of an Anencephalous Foetus, With an Unusual Malformation of the Heart." *Illinois Medical and Surgical Journal 1* (May 1844):22-24.

"Case of Rupture of the Uterus, With Occlusion of the Vagina." *Illinois Medical and Surgical Journal 1* (May 1844):25-27.

"On Compression of the Aorta as a Remedy for Uterine Hemorrhage After Delivery." *Illinois Medical and Surgical Journal 1* (June 1844):40-41.

"Dislocation of the Shoulder, of Eight Weeks Standing, Reduced." *Illinois Medical and Surgical Journal 1* (June 1844):42-45.

"Case of Deformity from Burn Successfully Treated by Plastic Operation." *Illinois Medical and Surgical Journal 1* (July 1844):57-60.

1845 "Cases of Surgery: Extirpation of Submaxillary Gland; Extirpation of an Encephaloid Tumor from the Neck." *Illinois Medical and Surgical Journal 2* (May 1845):20-22.

"Cases of Surgery: Diseased Testicle, Complicated with Hernia. Castration." *Illinois Medical and Surgical Journal 2* (September 1845):81-82.

"On the Kind of Union Obtained after Fractures." *Illinois Medical and Surgical Journal 2* (September 1845):84-85.

"Plastic Operation for Ectropion." *American Journal of the Medical Sciences* (N.S.) *10* (October 1845):356-357.

"Cases of Surgery: Injury of the Head Without Fracture of the Skull. Compression of the Brain from Effusion of Blood. Trephining. Recovery; Bony Concretion in the Knee Joint. Extraction by the Subcutaneous Method. Recovery; Foreign Body in the Bronchial Tubes. Laryngo-Tracheotomy. Death. Post Mortem Appearances." *Illinois Medical and Surgical Journal 2* (October 1845):97-101.

"Diseases of the Summer and Autumn of 1845." *Illinois Medical and Surgical Journal 2* (November 1845):113-115.

1846 "Comments: Cure of Encysted Dropsy, by Exciting

Irritation in the Sac." *Illinois Medical and Surgical Journal 2* (March 1846):177-178.

"Amputations for Scrofulous Diseases of the Joints." *Illinois and Indiana Medical and Surgical Journal 1* (June 1846):106-115, "Erratum." *Illinois and Indiana Medical and Surgical Journal 1* (June 1846):190.

"Amputation of the Superior Maxillary, Malar and Palate Bones, for Disease of the Antrum. Recovery." *Illinois and Indiana Medical and Surgical Journal 1* (August 1846):205-207.

1847 "Case of Abscess of the Female Breast, from which a Worm Was Discharged." *Illinois and Indiana Medical and Surgical Journal* 1 (February 1847):499-500.

"Dislocation of the Elbow, of Five Months and Thirteen Days Standing. Reduction." *Illinois and Indiana Medical and Surgical Journal 1* (February 1847):500-502.

"On the Inhalation of Etherial[sic] Vapor for the Prevention of Pain During Surgical Operations." (Editorial). *Illinois and Indiana Medical and Surgical Journal 1* (February 1847):544-549.

"On the Use of Strychnine as a Remedy for Intermittent Fever, Being the Substance of a Clinical Lecture Delivered at the Chicago Hospital, May 1st, 1847." *Illinois and Indiana Medical and Surgical Journal 2* (June 1847):114-120.

"Extirpation of an Abdominal Tumor of Large Size." *Illinois and Indiana Medical and Surgical Journal 2* (August 1847):193-198.

"On the Inhalation of Sulphuric Ether." (Editorial). *Illinois and Indiana Medical and Surgical Journal 2* (October 1847):382-384.

"On the Cure of Spina Bifida by Injection of the Tincture

of Iodine." *Illinois and Indiana Medical and Surgical Journal 2* (December 1847):475-477.

1848 "Aneurismal Varix of the Popliteal Space—Ligature of the Artery and Vein. Hemorrhage, Amputation, Recovery." *Illinois and Indiana Medical and Surgical Journal 2* (February 1848):505-510.

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"Case of Ununited Fracture of the Femur of One Year's Standing, Successfully Treated by Resection, Denudation, and Retaining the Ends of Bone by Means of Wire." *North-Western Medical and Surgical Journal 1* (August and September 1848):187-192. Abstracted in *North-Western Medical and Surgical Journal 2* (April and May 1849):83.

1849 "Treatment of Spina Bifidia [sic] by Injection of Tinct. Iodine." *North-Western Medical and Surgical Journal 1* (February and March 1849):495-497. Abstracted in *North-Western Medical and Surgical Journal 2* (April and May 1849):89.

"Retention of Urine from Stricture of the Urethra; Puncture of the Bladder Above the Pubis; 'Extroduction' of the Bougie; Recovery." *North-Western Medical and Surgical Journal 2* (April and May 1849):21-24.

"Popliteal Aneurism. Rupture of the Sac. Ligature of the Femoral Artery. Recovery." *North-Western Medical and Surgical Journal 2* (April and May 1849):28-30.

"On the Use of Etherial[sic] Solution of Gun Cotton in the Cure of Erectile Tumors Without Operation."

North-Western Medical and Surgical Journal 2 (September 1849):244-245.

"On the Use of Chloroform in Periodical Neuralgia." *North-Western Medical and Surgical Journal 2* (September 1849):286-288.

"Ulcerations of the Vagina, Connected with the States of Uterogestation and Lactation." *North-Western Medical and Surgical Journal 2* (November 1849):308-311.

1850 "On the Treatment of Dropsical Affections, by Injections of Iodine, &." *North-Western Medical and Surgical Journal 3* (July 1850):107-124.

"Tracheotomy for Abscess in the Root of the Tongue, Resulting Successfully." *North-Western Medical and Surgical Journal 3* (November 1850):316-317.

1852 "Case of Enlargement of One of the Ethmoidal Cells Resembling Exostosis of the Orbit. Operation—Recovery." *North-Western Medical and Surgical Journal 4* (March 1852):407-409.

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"Ligature of the Formeral [sic] Artery, for Popliteal Aneurism—Recovery." *North-Western Medical and Surgical Journal 4* (March 1852):414.

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"On the Treatment of Cancer by the Lactate of Iron Taken by the Mouth and Injected into the Veins."

American Journal of the Medical Sciences (N.S.) *23* (April 1852):561-563. Reprinted in *North-Western Medical and Surgical Journal* (N.S.) *1* (August 1852):157-159.

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"Case of Cartilaginous Exostosis of the Condyle, Ramus, and Angle of the Lower Jaw, for Which Resection with Removal of the Parotid Gland and Zygomatic Arch Was Successfully Performed." *American Journal of the Medical Sciences* (N.S.) *26* (October 1853):397-399. Reprinted in *North-Western Medical and Surgical Journal* (N.S.) *2* (December 1853):553-556. Also reprinted as the first case in "Cases of Disease of the Lower Jaw." *Chicago Medical Journal 3* (February 1860):61-67.

1854 "Essay on a New Method of Treating Ununited Fractures and Certain Deformities of the Osseous System (Prize essay)." New York: Baker, Godwin & Co., 1854. 44pp. and 2 plates.

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1855 "Notes of Experiments on Ulcers and Wounds, Designed to Serve as Aids to the Investigation of the Chemical Action Which Takes Place on Ulcerated and Wounded Surfaces." *North-Western Medical and Surgical Journal* (N.S.) 4 (April 1855):145-150.

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Useful Member." *Chicago Medical Journal 1* (September 1858):435-438.

1859 "Report of a Case of Deformity from Fracture, Successfully Treated by a New Method." *Chicago Medical Journal 2* (January 1859):5-11.

"Cases of Extirpation of the Parotid Gland and Other Glandular Tumors." *Dental Register of the West 13* (January 1859):335-339.

"Case of a Foreign Body in the Air Passages Three Months. Successful Operation, with Suggestions on the Best Means of Preventing Hemorrhage During the Operation, and Obviating the Effects of the Entrance of Cold Air after Tracheotomy." *Chicago Medical Journal 2* (March 1859):133-137.

"On the Treatment of Chronic Hydrocephalus by Injections of Iodine." *Chicago Medical Journal 2* (April 1859):197-217.

"Notes of Experiments on the Effects of Woorara Introduced into the Stomach." *Chicago Medical Journal 2* (May 1859):261-266.

"Sequel and Ultimate Result of a Case of Resection of the Knee Joint." *Chicago Medical Journal 2* (June 1859):340-341.

"Case of Congenital Absence of the Vagina, with the Uterus in a Rudimentary State, in Which an Operation Was Performed; With Reflections on the Operations Performed for Absence or Obliteration of the Vagina." *Chicago Medical Journal 2* (July 1859):389-400.

"Operation for Tumor of the Throat, and On the Use of Scissors Which Crush the Tissues in Operations for the Removal of Tumors, etc." *Chicago Medical Journal 2* (August 1859):473-476.

"An Essay on the Treatment of Spina Bifida (Hydrorachitis), by Injections of Iodine." *Chicago Medical Journal 2* (September 1859):517-538.

"Cases of Extirpation of the Parotid Gland and Other Glandular Tumors." *Chicago Medical Journal 2* (December 1859):709-717.

1860 "Case of Lymphatic Tumor; Varix of the Lymphatic Trunk." *Chicago Medical Journal 3* (January 1860):1-5.

"Operations for the Restoration of the Nose." *Chicago Medical Journal 3* (January 1860):25-27.

"Cases of Re-section of the Upper Jaw, with Suggestions of an Improvement in the Operation of Removal of Naso-Pharyngeal Polypi." *Chicago Medical Journal 3* (April 1860):215-222.

"Essay on the Pathology and Treatment of Erectile Tumors." *Chicago Medical Journal 3* (June 1860):325-356.

"Case of Spina Bepida [sic] Successfully Treated by Iodine Injections." *Chicago Medical Journal 3* (August 1860):450-453.

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1861 "Suggestions on the Tendency to Vacuum in the Cerebro-Spinal Cavity Which Exists in Certain Spasmodic Diseases." *Chicago Medical Journal 4* (January 1861):4-15.

"Subcutaneous Osteotomy: Report of a Case of Anchylosis of the Knee Joint Successfully Treated by Subcutaneous Division of the Condyles of the Femur, With Observations on the Application of This Method of Treatment." *Chicago Medical Journal 4* (May

1861):297-307.

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1864 "Ligature of the Common Iliac Artery." *Chicago Medical Journal 21* (March 1864):97-99.

1865 "Specialties and Specialists in Medicine." Address to the American Dental Association. *Transactions of the American Dental Association, Fifth Annual Meeting held in Chicago, July 25-28, 1865*, pp. 66-78. Reprinted in *The Dental Register of the West 19* (August 1865):303-316. Also reprinted in *Chicago Medical Journal 22* (August 1865):356-369.

Brainard sent his first paper to the *American Journal of the Medical Sciences,* a periodical which he had admired since his student days in Philadelphia. By 1844 he had encouraged and pushed James Blaney into publishing the *Illinois Medical and Surgical Journal.* This journal survived forty-five years under a variety of names: the *Illinois Medical and Surgical Journal* (1844-46); the *Illinois and Indiana Medical and Surgical Journal* (1846-48); the *North-Western Medical and Surgical Journal* (1848-57); the *Chicago Medical Journal* (1858-75); and the *Chicago Medical Journal and Examiner* (1875-89). Throughout his life Brainard published his works in this journal and took an active part in its editing, with the exception of the years 1856 to 1858 (when he was feuding with Editor Nathan S. Davis), and the war years and their aftermath (when his activities precluded writing and editing).

In addition to publishing a paper in nearly every issue, Brainard faithfully reviewed anatomical and surgical articles

and books, medicolegal books, and books by French authors. For young doctors the burdens of editing were somewhat recompensed by the opportunities to see other journals which were routinely traded around by editors hard put to find materials for their own journals and short of money to subscribe to other journals. Publishing companies sent books to review, an advantage which also helped to keep the editors current.

This bibliography omits reviews, reports of surgery clinics, editorials of local interest and minor papers. Approximately sixty percent of these papers deal with surgery. The majority of the surgical papers deal with fractures and orthopedic problems reflecting the high incidence of trauma cases in Brainard's practice. His keen interest in plastic repairs and the necessary surgical instruments and apparatus is reflected in his illustrations of the deformities and his diagrams of the instruments. An amazing twenty percent of the papers deal with chemotherapy, from the experimental animal studies on snake venom to the clinical studies of the effect of iodine on the meningocoele of spina bifida and of iron solutions on tumors. His style of writing and his interests make him our contemporary in spite of a chronological gap of one hundred and fifty years. The following section of selected papers demonstrates these qualities.

APPENDIX C

SELECTED PAPERS

Amputation at the Hip Joint

"Amputation at the Hip Joint" is Daniel Brainard's first publication. Like most physicians' first publications, it is a case report. Influenced by his school days at Jefferson Medical School, Brainard sent his first article to the medical journal he read most frequently—the American Journal of Medicine, *published in Philadelphia. He was very happy when it was accepted. As a Fairfield graduate, he was following the course of action urged by his former professor of medicine, Dr. John Stearns, who opened and closed every lecture with an admonition to his students to publish their observations.*

In this case the decision to operate was made by consultation of a group of Chicago's leading doctors. It was a grave decision because a major amputation had never been done in Chicago. Dr. Elijah Harmon had chopped off the frozen toes of the mailman, but limb amputations had been done only in the major medical centers. However, military surgeons, especially in the Napoleonic Wars, had had considerable experience but not much success. The first hip amputation was reported from England by George James Guthrie in 1812. The consulting group also decided that Brainard should be the surgeon, feeling that he was the best qualified even if he was the youngest member. Brainard noted that his patient was "timid," but there is no indication that Brainard himself was.

The account of the history and the record of physical examination are concise and thorough. Special attention is given to the thorax and abdomen, both on physical examination and post mortem, indicating his awareness of metastatic spread. The indication for circular incision rather than flaps is made. There is a graceful note of thanks for assistance. For those who collect euphemisms, there is the politic use of the phrase "diffusible stimuli" in place of alcohol.

This competent case report is included to provide a base line from which to trace Brainard's development as a writer, a surgeon and a scientist.

Amputation at the Hip Joint

by Daniel Brainard, M.D.

In January, 1837, I was called to Michael Donnahue, aged 25 years, a labourer, having a large tumour of the left femur.

He gave me the following history of his disease: Nine months previously he had his left femur fractured, about six inches from its lower extremity, by the falling in of a bank of earth under which he was labouring, at Schenectady, in the State of New York. Before this was properly consolidated, he travelled by a canal boat to Buffalo, from thence to Detroit by steamboat, and from thence to Chicago, a distance of about two hundred and fifty miles, on foot. Soon after his arrival here, he noticed a tumour on the outside of the thigh, growing from the place of fracture. It increased rapidly; soon involving the whole circumference of the limb, and nearly the whole length of the femur. At the time when I first saw him, the tumour extended downward to the knee joint, and upward to within three inches of the trochanter major on the outside, and within three fingers' breadth of the tuber ischii behind; measuring at its largest part, thirty-two inches in circumference. Its growth had been attended with but little pain; its surface was hard and irregular, and slightly tender on pressure. Two of the lymphatic glands of the groin were considerably enlarged. The general health of the patient had suffered much; he was pale and greatly emaciated; got no sleep at night, and had no appetite. Careful examination of the thorax and abdomen could, however, detect no signs of disease in either. As every means for arresting the growth of the tumour had been diligently employed without success, amputation seemed the only resort that offered a chance of recovery.

On the 14th January, the operation was performed, in the following manner. The femoral artery being compressed where it passes over the pubis by my friend Dr. Walker, a circular incision was made through the skin and tissues immediately subjacent, about four inches below the trochanter major; the integuments were dissected up, and a retractor applied. The

muscles were then divided by a similar incision, and the bone sawed just at the lower part of the trochanter minor. The femoral artery and the profunda femoris were then immediately secured by ligatures. Considerable pieces of cartilage and of diseased cellular tissue were removed from the surface of the stump; and all the small arteries that bled were then secured.

On examining the stump, the bone was found to be diseased; its cavity was filled with a reddish, gelatinous and semi-fluid matter. The periosteum was thickened, and in some parts cartilaginous. I then proceeded, according to my original intention in such a contingency, to remove the bone at its articulation. Dividing the psoas and iliac muscles and the muscles that come from the pelvis to be attached about the roots of the two trochanters, with a scalpel, and the insertions of the glutei and the capsular ligament with a bistoury, I was enabled with the latter instrument to divide the round ligament, and remove the head of the bone, without the least difficulty or delay. The articular cartilage over the head of the bone was thicker than natural, but the acetabulum appeared healthy. The hemorrhage was not great, except from the superficial vessels on the first incision; these for a moment bled profusely. Seven ligatures were required.

The patient was very timid, and suffered much from fear; during the operation he was so far exhausted as to require artificial warmth and diffusible stimuli, and remained thus depressed for a considerable time. On his reviving, the sides of the wound were brought together in a vertical line, and secured by adhesive straps, the ligatures being left out at the angles. A roller was passed around the pelvis in such a manner as to secure a compress over the glutei muscles, and afterward passed a few times about the stump, and the patient put to bed.

Evening. Has nausea and occasional vomiting; pulse 100, weak; no pain, but considerable restlessness; directed him to take sulph. morph. 1/4 gr.

15th. The patient has passed a good night; tongue white and dry; stomach still irritable; drinks rejected during the day. A sinapism was applied to the epigastrium, and the morphia administered in the evening.

16th. He has rested well during the night; pulse 95; tongue and skin dry; naused subsided. Sulph. magnes. ℥ i. was

directed; it moved the bowels once freely, and the morphia was then given.

17th and 18th. Pulse 93; skin natural; urine copious. The morphia was administered as usual at evening, the patient being unable to sleep without it.

19th. He has slept but little during the night; pulse 116; discharge from the stump profuse; dressings removed; the wound has adhered for two-thirds of its extent adjoining the superior angle; much serous matter and some fetid air escaped from the lower part on pressure. Morphia given as usual.

20th. Pulse 110; slight pain in the stump and in the bowels; skin dry. Tinct. rhei. ℥ i. was administered.

21st. Bowels have been moved freely; pulse 95; no pain; removed a part of the dressings; the serous discharge is copious.

22nd. No material change; diet more nourishing; morphia omitted.

23d. Dressed the stump; the four ligatures left out at the lower angle came away; the discharge much diminished and of good pus.

From this period until February 3d, nothing worthy of particular note occurred; the patient's appetite and digestion were good, and all the functions were well performed. On the 3d, the three ligatures that were left out at the upper angle came away. The man continued to do well, being free from pain and uneasiness of any kind, and able to move himself about without difficulty; the wound healing, and the suppuration daily becoming less.

February 15th. A hard tumour is discernible in the left iliac region; he is troubled at night with a dry cough; pulse 110; the wound continues to heal; the discharge from the 16th to the 25th February not amounting to more than f. ℥ i. in twenty-four hours. In the mean time, the tumour just mentioned increased rapidly, presenting a hard, knotted and uneven surface.

17th. The stump is noticed to be slightly swelled; and on examination numerous hard boides are discovered at various parts of its surface. The cough is severe, and not allayed by anodynes.

20th. An unusual pulsation is observed about the end of the femoral artery, which appears to be aneurismal in character. Cold applications and compression made to the part, and strict

rest enjoined.

26th. The pulsating tumour, which had gradually increased in size, gave way after a severe fit of coughing. On arriving, I found him weak and exhausted from loss of blood. I proposed to tie the femoral artery, but the patient and his friends refused to permit me. The same means were therefore continued.

From February 26th to March 1st, he failed rapidly; his cough was more severe, his pulse more frequent. The tumour before mentioned extended to the symphysis pubis, and projected above the crest to the ilium; and the projections on the surface of the stump were greatly increased.

March 1st. At one o'clock a.m., the bleeding recurred, and, the patient consenting, I placed a ligature around the femoral artery, just below Poupart's ligament. The pulsation immediately ceased. He lost no blood by the operation, and did not appear to be much affected by it. He continued to sink, however, and died on the evening of March 2nd, forty-two hours after the tying of the artery, and forty-eight days after the amputation of the limb.

On sawing through the femur and diseased mass longitudinally, the former was seen to be involved in its entire circumference, and from the condyles to near the trochanter minor; its cavity, too, on either side of the fracture, was filled with cartilaginous and semi-ossified matter. The largest part of the tumour sprung directly from the place of fracture; it consisted of alternate layers of cartilaginous and calcareous matter, disposed in form of radii. Other portions, entirely cartilaginous, spring from the periosteum above and below. Numerous distinct pieces, from the size of a pea to that of a hickory nut, were found in the ham and above the tumour, which were only loosely joined to the original mass by cellular tissue.

On opening the stump, a narrow passage was seen leading directly to the acetabulum, having its surface callous, like that of an old fistula. The acetabulum itself was sound; the cartilage had not sloughed, and its cavity was nearly filled with granulations springing from its edges. The ends of the divided muscles were tipped with cartilage, and similar pieces were imbedded between the muscles. Just at the end of the femoral artery was a sack large enough to contain f. ℥ iv., which had given way to its lower part. Above this the ligature was found

Fig. 30. Plush lined surgical kit of a nineteenth-century physician. (Photo courtesy of The Pearson Museum.)

about the artery; the inner coats of the vessel were divided by it.

On laying open the abdomen, a large cartilaginous and bony mass was seen filling up the hollow of the left ilium, extending downward into the cavity of the pelvis, and upward to near the kidney. The external iliac artery passed through it.

Both pleurae were found studded with pieces of bone and cartilage, from the size of a pea to that of an almond; they were mostly of a circular or oval figure, and flattened, so as to resemble a button in form; at the centre of each was a small calcareous granule, by which it was attached to the pleura. These were arranged in rows corresponding to the ribs, but not attached to them. Similar pieces in great numbers were found imbedded in all the lobes of either lung; most numerous, however, in the left.

No other marks of disease were observed in any part of the body.

The enlargement of the inguinal glands, mentioned in the description of the tumour, arose from the irritation of a blister, and subsided soon after the operation.

The reasons that induced me to adopt the method by circular incision in preference to that by flaps, were these: It was first intended to divide the bone through, or below, the trochanters; and it was necessary to remove the diseased muscles as high as the bone itself, while enough of the integuments must be left to cover the stump; this could most easily be effected by the circular incision. Such, however, was the ease with which the head of the bone was removed from the acetabulum, the neatness with which the sides of the wound came together, and the readiness of a great part of it to heal by the first intention, that it is not easy to conceive what advantage the more ordinary method can possess, even when the peculiar circumstances of this case do not exist, and when the design from the first is to remove the bone at its articulation.

To Drs. Goodhue and Walker, of this city, I am particularly indebted for their skillful assistance during the operation, as well as for their judicious advice both before and subsequently.

— Chicago, March 10, 1838.

Essay on a New Method of Treating Serpent Bite and Other Poisoned Wounds

"Essay on the Method of Treating Serpent Bite" was given as Brainard's inaugural address before the Illinois State Medical Society in 1854. His introduction was a brief apology for not giving a paper of general interest, followed by a firm statement of his conviction that the "first want and the greatest interest of the medical profession should be the improvement of medical science." The problem posed was "What is the best treatment for snake bite and poisoned wounds?"

There is an excellent historical review, including the treatise of the Abbate Felice Fontana published in 1767, a review of Humboldt's material on woorara, the poison used by South American Indians on their arrows, and his own information gathered from "military surgeons and intelligent travelers" on rattlesnake poison used on arrows by the Indians of California, New Mexico and Texas. He then reviews the treatments commonly used:

1. *Washing and sucking the wound, which might be serviceable but did not prevent death;*
2. *Incisions around the wound, which hastened death;*
3. *Lastly, the use of alcohol, the most commonly accepted form of treatment either externally or internally.*

Relative to this final point, Brainard demolishes this treatment with the following succinct arguments:

1. *When venom is mixed with alcohol it is rapidly fatal;*
2. *Alcohol injected into the tissue after a bite hastens death;*
3. *The coup de grâce—he personally authenticates four cases in which the bite of a snake proved rapidly fatal in an intoxicated person. He gives an added reference for a fifth case.*

Brainard then makes an additional statistical point that since not more than one in ten of wounds made by the most venomous snake proves fatal, a case of failure of a remedy is sufficient to counterbalance many cases of supposed success (shades of P. C. A. Louis!).

Next he records two groups of experiments—those made with woorara at the Jarden des Plantes in Paris and those made with a rattle snake bite in Chicago. He tried a number of different solutions but found that a mixture of 10 grains of iodine with 30 grains of potassium iodide, injected into the tissue, was the only solution which reduced the death rate by 50 percent without forming an eschar or other injury. He demonstrated these experiments before the group, using the woorara solution rather than the live snakes, thus waking his audience up without alarming those injudicious enough to have taken a drink at dinner. Having established the effectiveness of the treatment, he asks how the poison acted to produce its effect and how the iodine prevented death. In answer to the effect of the poison, he notes that it produces an alteration of the blood globules with disintegration, and if death is delayed, with defibrinogenation; and that it also produces a local action on the tissues. To the second question he replies that there is every reason to believe that the iodine neutralizes the active principle.

Brainard then notes that Dr. Whitmore of Illinois had proposed but not used iodine as a remedy for snake bite because of its effect on engorgement but that he personally had studied it as an antidote. There is an acknowledgment of the help he received from Drs. H. A. Johnson and J. C. Morfit and of his indebtedness to his young friend Robert Kennicott for procuring for him all the snakes he needed and for many valuable facts.

In contrast to the case report of seven years before, this essay is a scientific paper. In that interval Brainard had had two sojourns in Paris. There he had listened to the lectures of the great Spanish toxicologist M.J.B. Orfila and been influenced by Alfred Velpeau as a surgeon and also as an investigator of the effects of iodine on the body cavities. His scientific thinking had been stimulated by Francois Magendie and Claude Bernard. He had had the encouragement and the aid of Marie J.P. Flourens in the conducting of his experiments. The value of the statistical approach of Marie-Jean-Pierre Louis had impressed him. He had progressed from observation to clinical investigation. With this paper he joined William Beaumont, who had published his studies on the gastric juice in 1833, as one of the pioneer medical scientists of our country.

Essay on a New Method of Treating Serpent Bite and Other Poisoned Wounds

by Daniel Brainard, M.D.

Gentlemen of the Society—

It is customary, on occasions like the present to select as a topic for discourse some subject connected with the general interests of the profession, such as its history, its wants, its claims, or its duties. I hope to be pardoned for departing in some degree from this practice, and presenting before you a simple essay on a surgical subject. The reason for adopting this course is, a firm conviction that the first want, and greatest interest of the medical profession, is the improvement of medical science, and because I have made poisoned wounds, to which your attention is asked today, the subject of especial study, and entertain views concerning their treatment, which I believe to be both new and important.

The class of poisons to be considered is that denominated by Orfila, septic, or putrid poisons. It embraces, among other substances, the venom of serpents, the woorara or American poison used on arrows, putrid animal matter, as that inoculated in dissecting wounds, etc.

These substances possess the property, in common, of being innocuous, or little active when taken into the stomach; but causing the tissues to run rapidly into gangrene when they are placed on the surface of recent wounds, and of being more rapidly fatal when thrown into the blood vessels.

Christison and other toxicologists have not admitted the existence of septic poisons, but I think no one accustomed to witness the effects of the venom of serpents on a wound, could doubt the propriety of admitting such a division.

All rational views of the treatment of poisoning, date from the period when poisons were found to exist physically in the different organs of the body, and exert their influence on the solids and fluids by virtue of their peculiar properties. This discovery is due, mainly, to Orfila, and it is upon it that the practice is founded of using such means of treatment as are capable of neutralizing or diluting the poison, or causing it to

be eliminated from the system in the excretions. In the case of mineral and vegetable poisons, chemical antidotes are useful, but in a limited degree, and only when the substance to be neutralized is still retained in the stomach. As soon as it has been absorbed, dilution and elimination are the only means of obviating its dangerous effects.

My object in this address is to show that the venom of serpents and the woorara may be neutralized after being introduced into the tissues; to show the manner in which this may be effected, and to prove the efficacy of the treatment by experiment before you.

Before proceeding to speak of this treatment, it may be useful to cast a glance at some of the means reputed to possess efficiency against the bite of serpents, in order to show how slight are their claims of confidence.

Washing and sucking the wound, inasmuch as they have a tendency to remove the venom from its surface, are to some extent serviceable. Yet Fontana found them insufficient to prevent death, in birds bitten by the viper.[1] Sugar and common salt mentioned by Humboldt as the antidotes to the woorara used by the natives of South America, are without any effect, as Magendie has shown by experiment.

The strong mineral acids and aqua ammonia did not, in the experiments of Fontana, prevent the action of the venom of the viper when mixed with it before inoculation. Making incisions about the wound was found by Fontana to hasten death, after the bite of the viper. Nitrate of silver mixed with a solution of woorara, does not prevent its fatal effects. Mixing the venom of serpents, or the woorara, with alcohol or oil of turpentine, preserves them and makes them more active than when they are mixed with water. In cases where excision of the part, or its destruction by caustic, or the actual cautery have been resorted to, the result has usually been fatal. The use of cups upon the part, and ligatures about the member, are the only means known, whose efficiency against the venom of serpents has been proved by experiment.

Their beneficial action results from their power of retarding absorption, thus causing the poison to enter the circulation slowly. Pennock has shown that this is not produced by the removal of the pressure of the atmosphere, as Barry supposed, but by the pressure of the edge of the cup, which interrupts the

circulation in the vessels of the part.[2]

Alcohol taken to intoxication has at the present time the reputation of counteracting the effects of the venom of several species of serpents. The evidence in its favor is scarcely sufficient to justify the confidence reposed in it, as the following facts will show:

1. When mixed with alcohol the venom is rapidly fatal, if inoculated.

2. Alcohol injected into the tissues, or introduced into the stomach of birds, or of small animals which have been bitten hastens death. This circumstance is not conclusive, as alcohol is of itself a poison for them.

3. Persons bitten by rattle-snakes when in a state of intoxication by alcohol are not, on that account, secure. I have authentic information of four cases in which the bite of that snake proved rapidly fatal on intoxicated persons. Another may be found related in the *American Journal of the Medical Sciences*, Vol. 8, 1831.

As not more than one in ten of the wounds made by the most venomous serpents proves fatal, a case of failure of a remedy is sufficient to counterbalance many cases of its supposed success.

As the woorara is one of the poisons with which I have experimented, and the one which I propose to use to-day, it may be well before going further to say a few words on the subject of the nature of this substance. As usually met with, the kind which is brought from South America is contained in small gourds over the internal surface of which it is spread. On being detached it presents a dark color, has a resinous fracture [sic], a bitter taste, is readily mixed with water, but imperfectly dissolved by it. Its appearance is the same when mixed with alcohol; but both these fluids dissolve the active principle of it. The solution is neither acid nor alkaline. If the quantity of water used be small, the mixture has a ropy, tenacious consistence. The solution is coagulated by a nitrate of silver, and by the solution of iodine and iodide of potash in distilled water, and when treated with the latter solution, neither the part coagulated nor the fluid expressed from it retains its poisonous quality. It does not effervesce with acids. Its aqueous solution is not coagulated by heat, and boiling does not impair its activity.

The active principle has generally been considered as

analagous to strychnine,[3] and Pereira states that the strychuos toxifera yields the basis of it.

Nearly all recent authors have copied the account of its manufacture given by Humboldt[4] who enters into detail, and says it is made from the bark of the root of a species of *liane* called by the natives of the banks of the Amazon, Bejuco de Mavacure.

"The chemical analysis of the woorara has been performed by Boussingault and Roulin, (*Annales de Chimie*, Sept. 1828.) who found in it a bitter principle, *very different from the strychnia* acetic acid, gum, red coloring matter, salts, etc."[5]

De la Condamine states that it is an extract made by heat from the juice of divers plants, about thirty in number, and that the *liane* is one of them.

Such was the state of our knowledge on this subject, when in 1850 Messrs. Pelouze and Bernard read a note at the Academy of Sciences on the subject.

Mr. Goudot, who furnished them with a specimen of the poison, confirms in general the account of Humboldt, as to the manner of its preparation from the juice of the *liane*; but he adds the important statement that "before the extract is quite dry they drop into it some drops of the venom of serpents collected from the vesicles of the most venomous species." Messrs. Pelouze and Bernard conclude that "the woorara acts upon animals in the manner of a venom."[6]

From the discrepancy of these different accounts, it might be inferred that the various poisons prepared by the Indians of the Amazon and the Orinoco differ essentially in their properties; and Humboldt states that such is the case. There are, however, two facts stated by Humboldt himself which go to favor the opinion of Bernard and Pelouze. The first is that the juice of the *liane* before concentration is innocuous. The other is that "the Indians who have been wounded by poisoned arrows in war described to us the symptoms as entirely like those which are observed from the bite of serpents."

It is not probable that a juice from which a poison of such extraordinary activity is manufactured would be itself without power; and it is impossible to confound the effects of strychnia and those of the venom of serpents when applied to a wound on the human subject. For myself, having made more than a hundred experiments with the woorara, I entertain but little

doubt that the active principle of the specimens which I have made use of is the poison of serpents preserved in extractive and gummy matter. Those specimens were two. The first I believe to be a part of the same as that furnished to Messrs. Bernard and Pelouze by M. Goudot, as it was procured for Dr. J. W. Green and myself from M. Flourens at the Garden of Plants, by the Prince Charles Bonaparte. The other, which came from the Amazon, was furnished me by Dr. David Green, of New York. Their appearance and action were identical in every respect.

My reasons for believing its active principle to be the venom of serpents are these:

1. Its effects on birds and animals are strikingly like those produced by the venom of the rattlesnake; and in many cases no difference can be perceived between them.

2. These effects are entirely unlike those produced by the vegetable alkaloids.

3. Iodine neutralizes it as it does the venom of serpents, but has no such effect on vegetable alkaloids.

4. It is, like the venom of serpents, innocuous when taken into the stomach, except, perhaps, when used in very large quantities, or in circumstances very peculiar. This is not the case with any known vegetable poison.

5. It is well known that the poison used by the North American Indians for their arrows is that of the rattlesnake. I have learned this from such varied sources as not to leave any doubt on the subject. My inquiries have related to the Indians of Californa, New Mexico, and Texas, and been directed to medical officers of the army and intelligent travellers. The answers have never varied. The art of poisoning weapons is no longer a secret among them, but is often employed by those whites who adopt their customs. Dr. George Johnson, of St. Louis, who has traveled extensively on the Rio Grande, gave most accurate and valuable information concerning the habits of several Indian tribes in this respect. He states that there is a variety of rattlesnake on the Rio Grande, whose poison vesicle is much developed, and forms a prominent projection. This species is much sought for, on account of the quantity of virus contained in the sac.

I am, therefore, justified in stating that the poison used for arrows is, in some instances, the virus of serpents. There is

great reason for believing that the process of preparing it is, as far as possible, kept a secret except in what relates to the preparation of the juice of the plants destined to serve as a vehicle for the preservation of the venom.

If I am mistaken in this point, I come now to the method of treatment which I propose for wounds poisoned by the woorara.

1st. It consists in the application of cups upon the part, or of ligatures around the member wounded, so as to arrest absorption.

2d. In injecting or infiltrating into the subcutaneous tissue the solution used as an antidote.

The cups should be applied for a short time before the infiltration is employed, so as to fill the tissues with fluids, and prevent the injected liquid from producing abscess by mechanical injury. They should be allowed to remain on from five to ten minutes after the infiltration has been effected, in order to allow time for the antidote to come in contact with the poison before the latter has entered the circulation. In case much swelling and effusion have taken place before treatment can be applied, the application of cups would be unnecessary, as the fluid injected would in that case pass freely through the tissues without it. The strength of the solution should depend on the state of the parts, and the extent to which it is desired to disseminate it in the tissues. For a recent wound ten grains of iodine, and thrice that quantity of iodide of potassium to the ounce of distilled water should be employed. It should be put upon the wound, and the tissues filled with it for an inch around. When the swelling is already extensive, one-half or one-fourth the above strength will suffice; and the solution should, in that case, be disseminated as extensively as possible through the part affected, by introducing it, if necessary, at several different points. In a recent case I would advise one drachm of the solution to be injected.

In order to perform the injection or the infiltration perfectly, it is requisite to have cups to fit the inequalities of surface of the different parts of the trunk and members. Although ligatures can be made to arrest the circulation, and consequently the absorption, and fill the tissues with fluids, they do this less rapidly and less perfectly than cupping glasses. To perform the infiltration, small trochars like the exploring trochar are required, or they may be made still finer. To the

canula of the trochar a small syringe, like that called Anel's, should be adapted. After the trochar has been introduced, and the stylet withdrawn, the syringe should be adapted to the canula; while the injection is gently pressed in, the cupping glass should be gradually exhausted. This is the method I advise on the human subject. When it is desired to employ it for experiment, a small syringe, the piston of which moves with a screw of which half a turn presses out a drop, and of which the point is also adapted to the canula, should be employed to insert the poison in the tissues.

I was led to the belief that iodine is the proper application to the snake bite, by experiment. Selecting salts which had not been used by others, I found the selection I have recommended, to be the only one which prevented the fatal effects of the poison, without producing an eschar. The solution of the iodide of potassium alone, has no effect as an antidote.

I am aware that the infiltration of the solution into the tissues is the part of the treatment which will be longest in receiving the assent of physicians, and the most difficult to introduce into general practice. Nevertheless, it is easy to understand, a priori, the reason and the necessity for so doing. In order to neutralize a poison once introduced into the system, it is essential that the antidote should be also introduced, and placed there where the poison exists, and in contact with it. Now, in case of an inoculated poison, any application which is confined to the external surface of the skin, is necessarily insufficient, as it cannot pass through the cuticle. Antidotes taken internally cannot reach the poison in more than the slightest quantities. If they pass into the circulation, they are quickly eliminated by the kidneys. In inoculated poisoning, the antidote can only be successfully applied by inoculation, or, what is the same thing on a large scale, infiltration. Experiment proves this to be true. A quantity of the venom of serpents, or of woorara, once introduced under the skin, neither medicines swallowed, nor those applied externally, will prevent the death of the animal, unless these latter are caustics and instantly destroy the part. But the introduction of the antidote into the tissues is capable of neutralizing it. It happens fortunately in this instance, that the antidote is a substance whose effects, when introduced into the tissue of the human subject, are well known not to be injurious. The chemical

relations of iodine are similar to those of chlorine, but its actions are slower and less energetic, and it is probably from these that it derives its values as an antidote to septic poisons. It is certain that it prevents the discoloration and gangrene, which are always noticed on the surface of poisoned wounds when left to themselves.

My experiments were commenced with the venom of the rattlesnake, and made principally on pigeons, dogs and cats. Birds die from it much sooner than quadrupeds, and are therefore much more difficult to save by treatment. The way of using the serpent is, to have it confined in a groove, with only his head projecting. Denude the breast of the pigeon of its feathers, and when the fangs are raised in anger, press it against them. I prefer this method to that of extracting the venom and inoculating it for two reasons:

1. The poison, when extracted, is uncertain in its operation, being often composed in part of saliva, and sometimes wholly of that fluid. Fontana constantly found that the wounds made by inoculating the venom were less fatal than the bite of the viper.

2. The bite is the wound we are called upon to treat and is placed in circumstances less favorable than a wound by inoculation.

Of the pigeons thus bitten, and treated by iodine in the manner I have described, not more than one half die, and these are cases where it is impossible to bring the antidote to contact with the venom in time to prevent its action.

The serpent which I employed was the species called crotalophorus tergeminus, or prairie rattlesnake, and I have at the present time performed fifty experiments with the iodine on its bite.[7]

My experiments with the woorara were conducted in the following manner:

1. In order to test the strength of the poison, six drops of a solution, containing one fifth of a grain of woorara, was thrown under the skin of a pigeon. It died in five minutes.

2. I mixed the same quantity with twenty drops of a solution of iodine, of the same strength before given, and injected it under the skin of a pigeon. No symptom of poisoning.

3. Threw the same quantity under the skin of a pigeon, and applied a cup lightly over the point, twenty drops of the solution of iodine were injected through the same canula. No

effect.

4. Covered a deep wound in the muscles of a pigeon with a paste of woorara, in a few drops of water. Bird died in five minutes.

5. Same experiment. After the application of the paste the wound was washed with the solution of iodine. No effect produced.[8]

These experiments have been repeated by myself alone and in connection with others, over one hundred times, with the same results; and I feel confident, therefore, that their accuracy cannot be called in question, and that in regard to the woorara, it is quite safe to affirm that the solution of iodine neutralizes its action.

In making this statement, I would by no means be understood as asserting that it is so in all circumstances and in all proportions. The circumstances which prevent its being so are, the introduction of the poison in such a situation that the solution cannot reach it, or so directly into the circulation that is has not time to act upon it. In most cases of wound neither of these conditions is likely to occur.

According to the experiments which I have made, for the purpose of determining the proportion of iodine required to neutralize the poison, it appears that 1/3 gr. of woorara in solution is perfectly neutralized by 1/8 gr. of iodine and 3/8 gr. of iodide of potassium also in solution. When the proportion of the antidote was smaller death was prevented, but the effects were severe.

It will be seen that in regard to the woorara, no possible doubt of the neutralizing power of iodine employed in the manner indicated, can exist. Although in a purely practical point of view, this knowledge might suffice, yet it is by no means sufficient to satisfy the inquiring mind, or the demands of science. It is necesary further to ask—

a. In what manner does the poison produce its fatal effects?

b. In what manner does iodine prevent them?

c. The inquiry as to the modus operandi of medicinal and toxical substances has generally been regarded as chimerical, at least, if carried further than to assert that they act by being received into the circulation, by producing a sedative effect, by increasing the irritability, etc. Now, however valuable may be the knowledge that a poison cannot act without entering the

circulation, this fact in itself does not in the slightest degree enable us to understand in what manner it produces its effects. The other explanations offered are, in general, still less satisfactory.

In regard to the venom of serpents and the woorara, an attempt will be made to explain their action in a greater degree. These two poisons produce death in a similar manner, and by two kinds of action.

1. By changing the form of the blood globules.

2. By a local action on the tissues and fluids of the part which extends itself by proximity.

As an illustration of the former model, we may take the experiment of injecting the poison into the blood vessels. If a certain quantity of either of the substances in question be thrown into the current of the circulation, a period of time will elapse sufficient for it to reach the great nervous centres before its effect is produced. At this moment the animal dies instantly; as quickly as if the medulla oblongata had been removed, and apparently in the same manner. The respiration, sensation, and voluntary motion, are abolished. The action of the heart continues to some cases for a long time.

If, after death from their effects, we take blood from different parts of the body, (if it be a frog or pigeon that has been employed,) and subject its globules to a careful examination with a microscope of accurate defining power, and capable of magnifying 640 diameters, it will be found that they are altered in form, indented on the edges, the capsule appearing to be partially detached from the nucleus. Those taken from the heart and great vessels are sometimes least affected; and it will even happen that not one can be found in the field of the microscope exhibiting the characteristic appearance produced by the poison. On changing the field, more or less of the globules will be discovered to be affected. The blood scraped from the muscular tissue is much more affected, and that taken from the vessels of the nervous centres most of all; although in this not more than perhaps one in a hundred of these globules can be seen to be changed in form. It is probably for this reason that this change has been overlooked by some observers. The aqueous solution of the woorara destroys most of the globules of birds as soon as it is mixed with the blood, leaving only debris and granular matter. The different changes produced on this

substance when mixed with iodine are shown in the plate, to which the reader is referred for more complete information on this point. I have found a similar change to take place in a case of snake bite. In a bird which died of it I found, fifteen hours after death, the characteristic appearance of the globules noticed after death from woorara. In mixing the venom with blood, the uncertainty of its being pure, or more or less mixed with saliva, is likely to give rise to errors. In a wound from the bite of a rattlesnake Dr. Johnson found the blood globules destroyed. Dr. J. W. Burnett mixed the venom of the crotalus with blood drawn from the finger. The globules ceased to run and pile together, and remained without any special alteration of structure.[9]

According to my observations on birds and animals which die quickly of the serpent poison or the woorara, the blood is found coagulated. The destruction of fibrine [sic] and loss of coagulability is not in the living body an instantaneous effect.

There are, doubtless, changes produced upon the blood by these poisons which the microscope cannot detect. Those we have noticed as resulting constantly from the woorara are quite sufficient to account for death. The altered globules arrested in the capillaries of the nervous centres, which they are incapable of traversing, destroy their vital actions, and arrest these organs in the performance of their functions. Hence the effect, as before stated, is the same as annihilating or removing them. Those who are not disposed to admit so mechanical an explanation of the effects of so virulent a poison may find an analogous case in the action of olive oil or mucilage of gum, which, injected into the vessels, are almost as rapidly fatal as the woorara. They act, no doubt, by arresting the circulation in the capillaries. Mixed in an emulsion, the oil may be injected with impunity.

Woorara absorbed from the surface of the stomach is as harmless as olive oil—no doubt its mixture with some other fluid preventing its action on the blood.

In what way does iodine neutralize the action of the woorara? As the chemical character of the poison is unknown, it is impossible to describe the reactions which take place between it and the iodine. There is every reason to believe that iodine acts chemically upon the active principle, and neutralizes it. At the same time, it preserves the red color of the

blood and tissues, and prevents the tendency to gangrene which poisoned wounds generally manifest.

Iodine coagulates the solution of woorara; but neither the part coagulated nor the fluid expressed from it preserves its activity. Other substances, as the nitrate of silver, which coagulate it, do not neutralize it.

Of the local effect of the poison:

For a long time the most active poisons were supposed to kill from their action on the nerves.

When it came to be established, as is said, by the experiments of Blake, (the same thing had long before been shown by the experiments of Fontana,) that they enter the circulation, and that, so long as they are prevented from doing so, they produce no effect immediately, their local action, and that which they exert through the nerves, was neglected and overlooked. Many medicines and poisons have, nevertheless, the most decided local effects, independent of corroding or irritating properties. Thus belladonna dilates the pupil, rhus radicaus produces numbness of the hands. Many anesthetics have a local action, etc.

In regard to the poison of the serpent, it is most commonly its local action which kills. The part bitten becomes discolored; rapid gangrene occurs, which spreads upon the neighboring parts. *The muscular fibres of the part are the first affected with spasmodic action.* During the time when this action is taking place the pain is excessively severe, and the impression conveyed by the nerves is like that resulting from a shock, or crushing a part of the animal body, such as coldness, syncope, etc.

This local action is the cause of that dark discoloration noticed upon members bitten, and sometimes upon other parts. It does not result from inflammation, for all the fibrine [sic] of the blood disappears during this action. It most resembles those actions called catalytic, and it is the interstitial fluid of the cellular tissue first affected by it. It is a peculiarity of the woorara and serpent poison that they do not produce these effects except when inoculated. When swallowed they are absorbed without dangerous symptoms resulting; when thrown into the vessels they kill quickly, without any other perceptible change than that produced on the blood.

In stating that the woorara is absorbed from the mucous

surface of the stomach or intestines, and passes into the circulation, without producing fatal or dangerous effects, I am well aware that I am stating an opinion in opposition to one which has received the sanction of the highest scientific authority. Messrs. Bernard and Pelouze in their note already referred to, advance the opinion that the reason why woorara does not act when introduced into the stomach is, that this organ is incapable of absorbing it; and they relate some experiments going to show that the membanes of the stomach are incapable of absorbing it when in solution out of the body. This paper received a prize from the Academy of Sciences for the year 1850. Although well aware of the high authority of such a sanction, and of the skill of M. Bernard as an experimental physiologist, I have not been able, in this respect, to make the result of my experiments accord with his.

The following experiment, which I have repeated three times with every precaution, seems to me to disprove his views:

Take two drachms of a solution containing five grains of woorara, and introduce it through a small gum-elastic tube into the stomach of a pigeon which has been kept twenty-four hours without food or drink. Let the pigeon remain twenty-four hours longer without food or drink; kill it at the end of that time, and no fluid will be found in the intestinal canal. Wash the stomach and intestines with one dracm of distilled water, and inject this under the skin of another pigeon, and no effect will be produced. As the quantity introduced in the stomach was sufficient to kill twenty-five birds in five minutes, it seems impossible to avoid the conclusion that it is absorbed without injuring the pigeon, unless, indeed, we adopt the view that the poison is first digested. This view Bernard combats by experiments; but they cannot be considered as conclusive under all circumstances. They only prove that it may remain for a certain length of time mixed with the gastric juice in the stomach of a dog, and possess all its activty when taken out. I admit that the gastric juice has no power of decomposing the poison—at least, that there is no evidence of its possessing such a power, and that all the facts that we are acquainted with go to disprove it.

Lest it be supposed that I claim to be the first to propose the iodine as a remedy for the bite of the rattlesnake, I beg to state here that it was first proposed by Dr. Whitmire, of Illinois, who

states that the idea was suggested to his mind by reading Guthrie's remarks on its effects in removing engorgements. But, as recommended by Dr. Whitmire, it may have the effect of hastening the absorption of effused serum or fibrine [sic]—but that is all. Before my experiments no one had proposed it as an antidote to the venom, or proved it to be so by experiment, or discovered a method of using it by which the effects of the venom could be counteracted. It stood on a par with the innumerable other applications which have been recommended, but of whose true value nothing positive is known.

The conclusions which I think may legitimately be deduced from the preceding facts are these:

1. The woorara, in many cases at least, owes its activity to the venom of serpents mixed with it, and thus preserved.

2. Iodine, properly used, is an antidote for it, and, mixed with it before or after inoculation, or applied on a wound poisoned by it, is capable of preventing its dangerous effects.

3. The woorara produces its effects by changing the form of the blood globules, and by a local action, which consists in gangrene and decomposition of the tissues and fluids of the part affected.

4. The iodine acts by neutralizing the poison, and preventing the tendency to gangrene.

5. The woorara may be taken into the stomach, and absorbed without any ill effects.

(The photos originally accompanying this essay have been deleted because the inferior quality of the plates makes their reproduction impossible. Likewise, an appendix which Brainard included to explain his experiments has been excluded from this reprint. The text of the essay itself, except for references to Brainard's illustrations, has been included in full.)

Notes

1. *Traité sur le Venin de la Vipere*, etc. Florence, 1771, vol. 1, p. 106.
2. *American Journal of the Medical Science*, vol. ii, 1828.
3. *Elemental Materia Medica*, vol. 2, p. 364.
4. *Voyage to the Equinoctial Regions of the New Continent*, vol. 2, pp. 547-556.
5. Dict. de Mèdicin, Tome IX., p. 493.
6. Comptes Rendus de l'Academie des Sciences, Seance, October 14, 1850.
7. For a fuller account of these experiments, the reader may consult the annexed paper on the subject.
8. These experiments were repeated before the society with the result here stated—H.A. Johnson, Secretary.
9. *Proceedings of the Boston Society of Natural History*, Jan. 1854, p. 134.

Address to the Graduating Class of 1848-49

In the following address to the graduating class of 1848-49, Brainard avowed that medicine could not expect respect unless it conferred benefits on the human race. He then asked whether doctors could be dispensed with, and if so, could individuals by obeying natural laws of health protect their bodies against injury and disease. To the second question he responded vehemently: "It is not true that nature is the best physician." His answer to the first question was to list the benefits of obstetrics, pediatrics, medicine, and above all, of surgery.

This logic led naturally to the question of why cults and quackery could thrive. Brainard's conclusion was that the errors of application of the science of medicine rather than the science itself were to blame. Improvement would come from the removal of unskilled and ignorant doctors. He noted the efforts of the newly-formed American Medical Association to solve this problem, and while he hoped for its success, he questioned whether "it could accomplish the work of reform or whether it will but represent the conservative influence of the profession." These thoughts brought Brainard to another concern of the Association—the lengthening of the school term. He urged that this change should not mean just more hours of lecture, but should include added hours of patient contact in dispensaries, clinics and hospitals.

Dealing with this aspect of medical education about which he felt strongly led Brainard to respond with indignation to another related subject. He quoted: "The statement has recently been made by a Dr. Holmes, Professor in a not very flourishing school at Boston, that the multiplication of medical schools in the west is doing great mischief in the profession." Brainard's reply was that for an area "possessing all the advantages for containing a large

population, calculated from its extent and situation to be the center and great body of the republic, of which New England will soon be but a small appendage . . . for such a country to be dependent upon some village a thousand miles off for its physicians should certainly represent an anomaly in the general order of things."

And then more calmly he said good-bye "to the young gentlemen about to enter upon the practical duties of life in a profession so useful, honorable, and charitable as ours."

Address to the Graduating Class of 1848-49

by Daniel Brainard, M.D.

Gentlemen:

In performing the duty which devolves upon me on this occasion, of giving you, along with our final farewell as teachers, some words of advice and encouragement, my thoughts naturally turn again to that profession whose duties you are about to assume. That they are important and difficult beyond the power of most men to perform, none will deny; that they are useful, humane, and charitable beyond those of almost any other profession is not less certain. Our Profession has, however, its deriders; and these have more especially directed their shafts against its younger members; the characters and skill of those more advanced being too well known to admit of question. It will not, therefore, be inappropriate at this time to glance briefly at the claims which medical science and physicians have to public confidence and respect, for it were[sic] well that these should be fully impressed upon the minds of the younger members at the commencement of their career.

What has it done for the good of humanity? This is the first question which should be asked respecting any art or science; for whatever it may have done to enrich or ennoble its professors, however attractive and delightful it may be in its study or pursuit, it can scarcely be said to possess claims to confidence and respect, still less to the gratitude of man, unless it has conferred essential benefits on the human race.

We inquire, then, whether physicians constitute an essential part of society, or can their services be dispensed with?

It will not, we suppose, be denied that of all the evils, which afflict man, disease and pain are the first and the greatest. Whether it comes in the private circle, and lays its hand upon the new-born child, blasting the budding hopes of familes, or seizes the mature in years and mind, the guide and leader of society; whether it steals in solitary dwellings, a single victim, or stalks abroad as the pestilence, and falls upon terrified cities or nations, disease is still the greatest dread of man. It were[sic] beyond the power of the pen to describe the sufferings of a single individual in its grasp, and when taken in the aggregate the imagination of man could but faintly conceive the ills it produces.

> Dire was the tossing, deep the groans,
> Despair tended the sick, and over them
> Death his dart shook but delayed to strike.

There is a class of persons who deny, to a great extent, the necessity of our art, because they say diseases result from a violation of the natural laws, and might be obviated by their observance.

Without, by any means, denying that a violation of the laws of life is a cause of disease, we think that it by no means follows that they can be so observed as to entirely prevent its occurrence. It seems the natural inheritance of man. When he goes forth to brave the rude climate of the north, his blood is chilled by the freezing blast; in the tropics it is inflamed by the burning sun or poisoned by noxious exhalations. The pursuit of those arts necessary to his existence, leads to disease, and in the accomplishment of those efforts of mind required in all great undertakings, his energies are broken. A world, where the observance of natural laws would secure us against disease, must be one when the body never suffers from heat, cold, accident, or imperfect nutrition; where the mind is never subjected to anxiety or over exertion, or the hopes to disappointment. It would be a Paradise. If you live according to the best known rules, you are not secure against disease; and to reproach men thus placed with a violation of natural laws, is often cruel and unjust. It is not true that nature is the best

physician. Inexorable nature, like fate, heeds not the cry of the feeble but rolls on in her iron car, regardless of the victims crushed in her path. It is to art the suffering spirit turns, and not in vain, for relief.

Since, then, disease is a part of the inheritance and history of the human race, it is necessary, that a class of men should exist for its relief—men who should watch over it from the beginning to the end of life, who should search out the causes and nature of man's maladies, and soothe his sufferings in every "lane of life." Such is the required assistance, and it must be admitted that if any class does afford this, it deserves a high rank among the useful classes of society.

It will not be doubted by those conversant with the subject, that the accidents and diseases attendant upon childbirth, are, in a great degree, within the control of art. In no civilized country is the aid of medicine, under such circumstances rejected; and when we take into consideration the debt which society owes for aid so essential to its welfare as that received from the art of accouchment, we see at once its great and inestimable value. Those even, who deny the claims of medical science to respect, fail not to purloin and apply its principles in this instance to as great an extent as their skill will permit.

During the period of childhood, the watchful care of art is required to guard against the many dangers incident to that tender age; and there is, perhaps, none, even among those who oppose us, who may not be indebted to it for their own health and even their lives.

When we come to consider the different diseases of more advanced years, we find the power of medicine no less conspicuous.

If we take, for example, the class of inflammatory diseases, by which a large part of mankind have always perished, we find irrefragible proofs of the utility and efficiency of medical treatment. Statistics of cases of this kind have been given, and although forgery and falsehood have been resorted to, no reliable account of cases treated by any but the long established and approved methods has been given to show results equally favorable. On the contrary, the constant experience of any practical man, shows the fatal results of delay and inefficient treatment in such cases.

Next in point of fatality to inflammatory diseases are fevers,

especially in the western states; the universal experience of those who hear me will bear testimony to their curability under skilful treatment. It is probable that there is no country where the public is so much indebted to the profession for aid in restoring to health the great body of its citizens, as with us, and if the results are still fatal in many cases, it is generally owing to the fact that circumstances do not admit the general application of medical treatment.

We might go through with the whole catalogue of diseases and demonstrate that in each, art has been found either to cure or greatly to mitigate their danger.

But it is not necessary. I cannot, however, forbear adverting to the surgical division of medical science.

More difficult, perhaps, than any other, because coming in contact with incurable affections, it is, in many respects, so admirable and certain as fairly to challenge the admiration of every reasonable mind. What more admirable than the operation of tying arteries on the surface of wounds? What more beautiful than the results of skill applied to the reduction if dislocation or the treatment of fractures? How many thousands has it restored to the sight when blind? To the use of their members when crippled? It is the most humane, beautiful, and admirable of arts, and those who most strenuously deny the utility of medicine, are compelled to admit the value of surgery.

In prevention of diseases, the application of medical science has been at least as efficacious as in their cure. What language can describe, what imagination can conceive, the blessings secured, the ills avoided by the discovery and application of vaccination. We are less sensible of evils prevented than of those from which we are relieved, but when we learn that the rate of mortality at the present time, during the prevalance of the most fearful epidemics, as the cholera, is no greater than the average mortality of ordinary times but little more than half a century since, and find that the average duration of human life has doubled in a century, we shall be prepared to admit the benefit which science applied to health has conferred upon the human race in the prevention of disease.

Among all its benefits there is none more striking than the cure of the disease called mental. An individual restored from insanity to the use of his reason, is a noble trophy presented by

science to humanity, and there are annually thousands of this class to whom we might point as evidences of the value of our art. But when we consider that these affections are, in a great degree, transmitted by hereditary descent, and that in proportion as they are neglected they become more numerous and inveterate, and constitute a larger proportion to the whole number, we perceive more fully the value of such treatment. Extinguish the lights which science has shed upon the darkened chambers of the human intellect, and you consign the unfortunate subjects of disease to their former rank as outcasts or criminals—objects of dread and disgust, without sympathy or hope.

It seems strange, if but a small part of these benefits are real, that any should doubt the utility of medical science, or question the claims of physicians to respect. It becomes us, therefore, to examine the objections which may be brought against them.

The first of these, urged from the earliest times, is that medicine is uncertain.

This objection, more or less valid in the earlier stages of the art, has gradually become less so, until at the present time it has no real value whatever. For we have already seen that in regard to the great majority of diseases, the effects of particular modes of treatment are capable of accurate demonstration. If it is in many cases uncertain, the difficulty is in the varying and changeful nature of the objects with which it deals, and not in the principles of the science itself. These, so far as relates to the symptoms of disease and the effects of remedies in given cases, have, within the last half century, been brought to an admirable degree of perfection.

But another objection is, that it cannot cure all diseases. Consumption, cancer, typhus fever, and other diseases, are beyond your reach.

To this we reply, that it is not the object or probable end of medicine to cure all diseases; death being the allotted end of all human beings, will doubtless take place through the means of disease. But the cases in which medicine is useless, are yet much fewer than is supposed. Consumption is in a large number of cases a curable disease; and if the contrary appears to be the case, it is only because from its insidious approach it is usually after organs essential to life have been destroyed that relief is sought. Indeed, there are few diseases in their nature

incurable; they mostly become so by neglect, and of these the number is daily becoming smaller.

When a cure is not to be effected, there still remains the alleviation of suffering, the cheering and sustaining of the restless sufferer under disease, which are among the most precious services which man can render to his suffering fellow-man.

Such are the services which the medical profession throughout the civilized world daily renders. In every climate, in every place, wherever disease is found, there is a physician striving to relieve it; and whether successful or not, his mission is nevertheless divine and charitable, soothing and consoling beyond the power of words to express. Such is the science you profess, and so noble is the work on which you are bound. Beware of them who would draw you from it, or make you undervalue its ministrations. They are disappointed candidates for eminence in some useful way, narrow minds which cannot embrace a subject so extensive, or apply in practice an art requiring so much skill.

Medical science embraces every known method of curing disease. Whatever may be the principle, if it be found useful it is adopted. The true physician, therefore, cannot select a partial class of remedies exclusively, or devote himself to a single idea to the rejection of all others. He seeks out and adopts every improvement; his motto is, progress; his course is onward, but he advances by the path of experiment and induction, not by that of imagination or conjecture.

But whence comes it that empiricism thrives, that false theories prevail, that absurd systems are built up? It results from two causes: first, the power of falsehood, which, by means of the facilities of giving notoriety and practicing imposition, is enabled to fatten and thrive upon public credulity. It is useless to expect that this will ever be otherwise, so long as knavery and folly exist together in the world.

But the second cause is of a different nature, and is susceptible to a great degree of being remedied. It consists in the wide difference between medicine as a science, and its application to practice. If, as a general rule, patients when they called upon a physician, received all the relief which the art of medicine is capable of affording, there would, it is probable, be but little reason to complain of the public preference to

quackery in so large a number of cases. But it happens, unfortunately, that this so far from being the case, is the rare exception. How few do we find thoroughly skilled in a single branch of the art. How much more rare to find one acquainted with all. But the public are obliged to judge of it from what they see of its application to practice. Every false diagnosis, every failure to arrive at the most appropriate remedy, every error of judgment, is by them circulated as an evidence of the uncertainty or insufficiency of medicine. Here we see that a great part of the evils of which we complain, a large proportion of the inconveniences we suffer, exist in the profession itself. For if we believe that the science of medicine has attained a high degree of perfection, and that its skilful and qualified practitioners are among the most useful of men, we must admit that the unskilful and ignorant are its opprobrium, and fully as likely to be nuisances as useful in their vocation.

These facts have long been felt, and so much so of late that, a general and combined effort, through the medium of a National Medical Association, has been made for their removal. What will be the result of its action, it is difficult to say; whether it will accomplish the work of reform, or whether it will but represent the conservative influence of the profession, remains to be seen.

The recommendation to lengthen the lecture terms—the most important it has yet made—seems to be regarded in many quarters as of doubtful propriety. It is in imitation of the courses of European schools, where the instruction, extending through a longer period of time; is composed of about the same number of lectures as with us. But in their case the attention of the student is in the mean time occupied by attendance upon hospital practice and private courses, so as to fill the whole period of time fully as much as it is occupied during the few months in this country. Whether the increase of the time of attending lectures, without any other additional facilities for obtaining instruction, is likely to prove very beneficial, is extremely doubtful. It would seem that the lectures already occupy a sufficient share of the time and attention of the student. They are aids, but by no means substitutes for study, dissections, and observations at the bedside of the patient; and it would seem that these latter should be the parts of medical education to whose improvement attention should be more

especially directed. It is not theoretical, but practical knowledge and skill which is deficient. No doubt a proper acquaintance with medical literature is desirable; no doubt an attendance upon lectures greatly facilitates the acquisition of knowledge; yet when these are unaccompanied by clinical teaching, they are far from making practical physicians.

The art of observation, which lies at the foundation of all practical skill, is learned and can only be acquired at the bedside. Here, if we mistake not, lies the great evil and defect of our system of education. It is not that our lectures are not well attended, or that as a general rule the lectures are not sufficiently instructive; it consists in a want of the means of familiarizing the student with the forms of disease—in a habit of passing too rapidly and superficially over the different branches he should pursue.

The plan for a national association of delegates, seems to have been a fortunate one. Even whether the measures it adopts are sufficient to remedy the evils complained of or not, it will have the advantage of arousing public attention, and of directing it to the proper means of effecting that object. It is here, if we mistake not, that the source of improvement is to be found. If physicians are not properly educated at the present time, it is assuredly due in a great measure to the fact that public opinion in the profession has been wrong on this point, and young men have been taught to believe that two or three years' study in the office of a physician, and attending a course of lectures, was not only sufficient to enable them to "get along," but was a liberal allowance of instruction. It certainly was a great improvement on the system which preceded it, for then nothing more was required than that a student should apply to a judge of a court, who in the exercise of his discretion could grant a license to practice. At that time a large number of practitioners never witnessed dissections, and there were even many who never saw a skeleton. If we compare the period of which we are speaking—not by any means remote—when medical books in circulation were scarce and imperfect, when medical schools were few and distant from each other, and the attendance upon a course of lectures a rare exception, and hospital attendance almost unknown, with the present, in which the press teams with elaborate works, in which schools are multiplied and attendance upon two courses of lectures

with frequent dissections and clinical instruction, are required, surely we cannot fail to perceive the rapid advances which have been made, nor to look forward to the future with confident and well founded anticipation of further improvement.

Those who complain of the degenerate state of the profession in recent times, must, it seems to us, have failed to imbibe its spirit. They cannot be aware of the vast strides which it has almost yearly made; it is they alone who are benighted.

Our own country has shared honorably and largely in the general activity and improvements, although its medical character and literature are far from having attained that high national standard which they should acquire. We are dependent too much on foreign works, even as text books; but there are indications of a favorable change in this respect.

The western states have been the theatre of far greater advancement in the character and intelligence of the medical profession, than any other part of this country. From having had a few years since but two or three medical schools, there are at present at least a dozen; and without instituting a comparison between these and other schools, we may safely claim that the teachers in them are as capable of teaching practical medicine in the diseases of the country in which they reside, as those at a distance who have never seen them; and they give advantages of public instruction yearly to hundreds of young men who otherwise would be entirely deprived of it. The idea of a country or a part of a country being dependent upon another for its educated men in any branch of science, implies an inferiority in intelligence which is not for a moment to be tolerated as applied to the west.

The statement has recently been made by a Dr. Holmes, Professor in a not very flourishing medical school at Boston, that the multiplication of medical schools at the west is doing great mischief in the profession. Whether this opinion was formed after a full consideration of the wants of the western states, and an acquaintance with the schools themselves, or whether it was but the expression of a prevalent impression, founded upon what the west was some years since, we have not the means of knowing; but we feel assured in either case that it cannot be sustained after considering the facts of the case. The western states have heretofore been supplied, to a very considerable extent, with their medical practitioners from the

country schools of New England. These setting aside the fact that their professors possessed no acquaintance with the peculiar diseases of this region, afforded no opportunity for clinical instruction, and in many cases their rules admitted of graduation after two courses of lectures, both attended during the same year, without reference to the term of study. Under these circumstances, medical schools have been established in various cities and towns of the western states, possessing every facility for affording medical instruction. The right to do so is clear, and the good policy of this course is equally evident.

For a country, possessing all the advantages for containing a large population, calculated from its extent and situation to be the centre and great body of the republic of which New England will soon be but a small appendage, inhabited by a population composed of a fusion of the different European races, and brought, under favorable circumstances, to a degree of activity and enterprise unequaled elsewhere—for such a country, with all its advantages, to be dependent upon some villages a thousand miles off for its physicians, would certainly present an anomaly in the general order of things, which nothing but an inability to observe and teach successfully could explain. We need not say that no deficiency of this kind exists, and that the western states have abundant talent of native growth, and names among her professional men known and deservedly honored throughout the whole country.

We are not of the number who think that the increase of medical schools is likely to be attended with any very injurious effects upon the public or the profession. If it be true that the great difficulty in the way of the profession consists in a want of sufficient qualifications, it seems but natural to suppose that by the increase of schools a larger number of persons might be qualified to perform the duties with success.

It is certain that until some mode is adopted by which to open the roads to eminence equally to the profession at large, no other remedy for the evils of monopoly can be found but the indefinite multiplication of medical schools. Nor does it seem probable that the number is likely to exceed the wants of the community to so great an extent as many suppose. In the new states, the labors of the physician are extremely ardous; they are often so severe as speedily to impair his health, and the inducements to draw him from professional to other

occupations are numerous. The fields for the exercise of professional skill are daily increasing in extent. But a few years since, the place we inhabit was on the extreme verge of civilization, and stretching far away to the west was a desert scarcely trodden by the foot of civilized man. Now the emigrant turns from our crowded streets, and well-peopled prairies to the far distant shores of the Pacific ocean, where his hopes, taught by the recent history of the western states, paint cities, towns, and a thriving land—the home of freedom and the arts—us [sic] about to rise and expand before his view. To you, young gentlemen, about to enter upon the practical duties of life in a profession so useful, honorable, and charitable as ours, life seems to present attractions not often found in similar circumstances. The field of usefulness is rich—vast as the ambition of man can desire. Your life, if you worthily follow your profession, is to be one of perpetual charity, of daily relief to suffering. Let me urge you never to forget those pure and honorable principles which should ever guide and characterize men entrusted with so important an office—fidelity and strict attention to those entrusted to your care, respect for your professional brethren, and above all, a regard for the character and usefulness of the profession. Your character and interests are henceforth identified with it. In proportion as you devote yourself to it, will be the return you may expect to receive. Set your mark high. Fear no obstacles; let the one object of eminence and usefulness be always before your mind. Whatever you determine on now, if followed out with suitable perseverance, you will scarcely fail to accomplish. Whatever may be the result, no pursuit is more worthy of occupying your lives than the acquisition of knowledge and its application to the relief of human suffering.

For us who have aided you, according to our means and ability, in your progress thus far, our desire for your welfare and our efforts for the dissemination of knowledge and correct principles, will not be relaxed but followed up with renewed vigor. It is now seven years since the germ of our medical college was planted. Six individuals were found willing to listen to the teachings of a private course at that time upon a single seat; the next year another was added, and the third year some twenty persons were in attendance upon our course. By some these early efforts were regarded as premature, by others as

altogether misplaced; yet the progress of events has shown that the time and place were well chosen. Step by step has the school advanced, until its alumni constitute a large body of the most respectable practitioners of a wide extent of country. Their students constitute our classes in a great measure; and our infant institution has already acquired a development which is a guarantee of its future advancement. It is associated with the destinies of a great and powerful city, and its prosperity and continuance will be commensurate with her growth and duration. It can never perish. Like a ship entrusted to the sea with bright sunshine and smiling skies, in its course it must meet with storms; the winds may rage against it, the waves may beat upon it, dark clouds may gather above, and rocks rise beneath it, but it will come in safely through every danger to the protected waters of the distant haven.

Specialties and Specialists in Medicine

"Specialties and Specialists in Medicine" was the last publication of Daniel Brainard. The subject was of great interest to him, and was a natural outgrowth of his belief that the interest of medicine should be an interest in the science of medicine. It was delivered to a meeting of the American Dental Association because dentists were more interested in specialization than physicians. In fact, many physicians looked with disdain on this idea. Thus Nathan Smith Davis, who so strongly favored a sequential curriculum, looked down on physicians who limited their practices.

First there is a careful history emphasizing the fact that in teaching and often in practice there had already been a division into medicine, surgery, obstetrics and pharmacy. Brainard then discusses the advances in genito-urinary surgery and ophthalmology, bringing out the fact that new instruments had effected great advances. He deplores the fact that treatment of fractures had not received the attention that treatment of stones in the urinary tract had. He looks forward to the day when there would be specialty doctors for the treatment of diseases of the heart and lung, when incapable obstetricians would not be allowed to use instruments, and when there would be specialists trained in the treatment of tumors.

Brainard felt that there should be a basic medical education for all physicians, but that there should be teachers of specialties on the faculty so that students who developed specific interests could have further teaching and training. He would have been at home in the medical school of today.

Specialties and Specialists in Medicine

by Daniel Brainard, M.D.

Gentlemen of the American Dental Association:

It gives me great pleasure to meet here the members of so honorable and useful a profession as yours. The profession of Dentistry is one of very modern origin, and is that branch of the medical profession which owes its development and perfection most essentially to our own country, and is indeed, I think I may say, the one branch of the profession in which we Americans can claim especially the pre-eminence. To be an American dentist is a recommendation in all the principal cities of Europe, and although the medical professional in general, and the surgical department especially, has an honorable position in the literature and among the profession in foreign countries, it can hardly be said to have a claim to the title of any pre-eminence.

I have said that your profession was of comparatively recent origin. It is almost, I think, within the memory of many persons here present when it was regarded as a merely mechanical operation, little better than the higher branches of mechanical employment. Step by step it has developed itself to a degree that, in perfection, in usefulness, it does not, in my opinion, rank second to any of the single branches of medical or surgical science; so that at the present day, to be without a dentist would be to be without one of the essentials of civilized life.

Now, in speaking of its having a mechanical origin, I do not intend anything disrespectful to it. My own especial branch of the profession is surgery, and, I might say, a part of surgery; and it is not very long since surgeons, as a class, occupied a position far less honorable and important than that occupied by dentists at the present day. In the Middle Ages, in Europe, so called, or rather in the latter part of the Middle Ages, from the fourteenth to the end of the fifteenth century, or thereabouts, surgical operations were performed by barbers. There was no distinction between those that performed a surgical operation and those that cut hair, and curled hair, and powdered hair. The duty of the surgeon was considered to be to perform an

operation when he was directed, and as he was directed by a physician, and, when he had performed the operation, to retire and leave the case to the physician. And it happened, after a certain period of time, that these operators acquired a certain amount of knowledge beyond the immediate needs of operating, and were called upon to advise about operations, and about the treatment of cases after operations. And this was considered a great innovation upon the profession. It was considered something outrageous and disgraceful to the profession; and the man who should have consented to meet a surgeon in consultation would have been expelled from the faculty for consulting with a quack. I have in my library a work published by the President of the Faculty of Medicine, in Paris, entitled "The Brigandage of Surgeons," setting forth that they were asserting claims which, if allowed, would be the destruction and disgrace of the medical profession.

This comparison I bring forward for the purpose of sustaining the assertion that I make, that the difficulties under which the dental profession labors are nothing new. By speaking of the difficulties under which you labor, I mean this: the difficulty and length of time which it has taken for the honorable, and educated, and competent men of that profession, to assert and maintain full equality in professional standing with members of the medical profession who practise other branches of it. That difficulty has existed in regard to every particular branch of the profession that has at any time been embraced by any particular class of men, and is not peculiar to the dental profession. It results from that deep-seated prejudice, for I can call it by no other name, that has existed from the earliest times and is inherent apparently in the nature of every profession, and that is, to resist innovations or changes in regard to the doctrines or the practices of that profession. This peculiar aversion to changes results from the nature of professional education, and is one of those things that is treated of by Lord Bacon in his *Novum Organum*, under the name of "Idols of a Class," or those things which prevent members of a particular class from seeing the truth in regard to their own profession. It is, and has been, one of the great obstacles to the progress of the medical profession. It is an obstacle which at the present day is partially, but only partially, overcome. It is the thing which has prevented a large

number of men of genius and industry in the profession from embracing and following out the study and practice of a particular class of disease, in such a way as to have perfected our knowledge of the nature and treatment of such diseases.

Now, the principle that I wish particularly to assert here is this, that the medical profession, in order to be most useful, in order to acquire its due influence over the community, in order to perfect its knowledge of the nature and treatment of diseases, must adopt a special course of study; each individual member embracing that course which he judges on the whole to be best adapted to his faculties, and leaving out to a certain extent others for which he has no qualifications. I advocate special studies and special practice; and, although the words have been somewhat discredited, I advocate "specialties" and "specialists."

Now, I undertake to say that the very great opposition which this doctrine has met in the profession, is not founded upon reason or justified by the experience of the profession. It is an opposition which is working to the disadvantage of the profession, as well as the public, and to the manifest disadvantage of a very great number of the individual members of the profession; and therefore I wish to insist a little upon the point.

What are the natural divisions of the science and practice of medicine? Is there no natural division? I hardly think that any one would be so bold as to assert that there are, and ought to be, no natural divisions. For a long time, when the science of medicine was in a very rude and imperfect state, the members of that profession did study and practise all its branches; and, in the older works on Surgery, Pharmacy and Chemistry were as much treated of as the operations of surgery. Still, even at that time, there was the commencement of division, and the first was into Pharmacy, Surgery and Obstetrics. The next division which came was into Medicine and Surgery, Surgery being, as I have stated, the mechanical application in the manner already indicated. At a later period, there commenced to be apparent the distinction between the obstetrical department of the profession, and the separation between Pharmacy and Medicine was accomplished entirely. By degrees the distinction between obstetricians and medical practitioners came to be recognized in particular localities, in large cities

especially, to a very considerable extent; so that medicine, towards the middle of the last century, might be said to be divided into Pharmacy, Medical Practice, properly so called, Surgery, and Obstetrical Practice; whilst yet it remained true in regard to the greater portion of the civilized world—the country in general, in America as well as in Europe—that the larger number of practitioners continued to practise all its branches, to collect and prepare their own medicine, to practise Pharmacy, Surgery and Obstetrics. And at the present day, this is the case with a very large part of the profession throughout the civilized world.

Now, it is manifest—all experience and reason show—that men who practise medicine in this way practise it only in a rude and imperfect manner; that they neither understand Pharmacy, nor Medicine, nor Obstetrics; that, from the nature of things, they are incapable of acquiring skills in any one of those branches; that it is absolutely necessary, in order that there should be any progress in regard to the science or practice of medicine, that some of these should be excluded, and others proceeded with especially, by each individual member of the profession.

Let us examine the question for a moment. The Dentists, as a body, have, according to my own knowledge and observation, perfected the mechanical means of performing operations beyond what has been done in any other branch of the profession. They are better mechanics than the Surgeons, and their instruments for accomplishing the different objects which they have in view are more numerous and better suited to their purpose than are the instruments of surgeons. Now this is essential to the proper performance of dental operations. And how has this happened? It has been simply that there have been dentists, as a class, who have devoted their attention to that purpose; and we as surgeons never could have invented or perfected these instruments, and consequently could never have perfected dentistry. And that division of labor is a thing which, at the present day, is manifestly necessary, and which no one now disputes.

In regard to surgical instruments, there are two departments in which they have been singularly perfected. The one is in regard to those instruments which are used for crushing urinary calculi, which are the most admirably adapted to their

purpose. How did that come about? Three men of genius at the same time happened to devote their whole attention to that thing—the crushing of stone—and they especially perfected those instruments. And without that perfection of these instruments, the crushing of urinary calculi must have remained forever, as it had up to that time, a mere phantom floating in the mind without any practical application whatever. Therefore it was necessary in this particular that there should be special studies. The other branch in which I consider the mechanical means to be wonderfully perfected, is that regarding instruments for operations upon the eye. These instruments have been brought to such a degree of perfection, of delicacy and accuracy, that they are capable of accomplishing things almost inconceivable, and accomplishing them regularly, constantly, and without difficulty or danger. Now, how has this happened? It has happened in the same way; there have been a class of men who have devoted their attention to that subject exclusively, have thought of nothing else, have worked at nothing else but the perfection of means for the accomplishment of that which they saw before them to be done. But when you come to other things that have not been made specialties, the condition of our science is singularly rude and imperfect. There is nothing in our science at the present day which has the slightest claim to be respectable apparatus for the treatment of fractures. Particular individuals, by the attention which they have paid to it, and by an excess of superior mechanical talent or ingenuity, have been able to accomplish with the instruments which they use a considerable degree of success, but there is no instrument for any given fracture that can be mentioned, that can be taken by a person of ordinary good education of the profession and put upon the member in such a manner as to accomplish any perfect result. The greater number of the instruments which are used in the profession for fractures of the leg, and called "fracture boxes," are not anything better than dry-goods boxes, and simply serve to accomplish the result of concealing from the surgeon the position in which a limb may happen to lie. What is the reason for that? The reason is, that there never has been as yet any instance that a man devoted himself to fractures as a specialty, and nothing else, and this is the one branch in which a specialty is most needed. They are the species of accident which are the

most frequent, and which disable a man more than any other, and entail untold miseries upon him if unskillfully treated; but the instruments for the accomplishment of this purpose never will be reduced to any great perfection, until it shall be known that the devoting of time and talents to one subject leads to honor and not to being partially thrown out of the profession.

If I should be unfortunate enough to meet with a fracture of the jaw, the first thing I should do would be, not to send for a surgeon at all. I should send for a dentist. They have directed their attention to the mechanical means and apparatus necessary for holding the jaws in their place, to such an extent, that they are better qualified to make them than surgeons are, as a general thing, and, perhaps I might say, more than any surgeons are.

I might go on and point out to you that with regard to no one thing about them are the instruments used by surgeons, the best adapted to their purpose.

We are disputing at the present day, all over the world, what kind of sutures are the best to use. A great many of our instruments for the purpose of ligating arteries and performing similar operations, are singularly rude and imperfect, and their imperfection is only remedied by the skilful use of the fingers of the surgeons.

How is this to be remedied? It is to be remedied, gentlemen, by special study; by the profession changing its views upon that subject, and saying to the young men, when they are entering the profession and when they are about to leave the schools, that it is better for them to devote themselves to some particular branch of the profession, and try to understand it. I often have young men from various parts of this country, who are here to visit the West for the purpose of locating themselves in their practice. They very frequently come to Chicago, and we are always glad to see them. We are very proud of our city, and if you want to get into the good graces of any Chicago man or woman, you have nothing else to do but to tell them it is a nice place. But these young men come here and they say: "What kind of a place is Chicago for a professional man?" Now that is a very hard question to answer, because politeness does not permit me to ask another question. I could say to the young man, that if you know any one thing better than the generality of the profession, it is a good place for you; but if you do not, it

will be a bad place for you. And for those young men who are incapable of applying their knowledge in such a way as to earn their daily bread, incapable of using their knowledge for the benefit of any particular class of men, so as to make it desirable for them to call upon them, Chicago is not the place. That is the difficulty under which members of the profession labor when they would enter into practice.

How is this to be remedied? It is to be remedied, in the first place, by acting upon public opinion. The profession which listens with leaden ears to the propositions which come from members of it to change the time-honored usages to which it is subjected, is sensitively alive to intimations which come from the people who employ them. Public opinion in this country is law, and in order that the laws be made good, public opinion must be enlightened. Individuals are powerless, but ideas are irresistible; and the way to remedy it is to take the idea or fact that in order to make the profession useful and powerful, it must be developed and perfected in all its branches, constituting each one of these branches one body, each part of which co-operates in its proper sphere and most useful manner in advancing the interests of the whole profession.

Now, in saying that I am in favor of special studies and practice, in that way, I do not commit myself to anything; and the profession wont regard this as anything but a "glittering generality." Therefore I state that I think there ought to be Dentists to attend to the teeth, Oculists to attend to the eye, Aurists to attend to the ear, and special Physicians to attend to diseases of the heart and lungs and make the physical examinations which are so difficult, and a special class who will be able to use the microscope for special examinations; that there should be not only practitioners of obstetrics, but those especially devoted to different branches; I mean that the incapable obstetrical practitioners never should be allowed to use instruments; that there should be men qualified for that. And then in regard to surgery, that it should, in addition, have a number of branches. That in these there should be one branch devoted especially to the treatment of fractures. There should be another branch devoted to the treatment of tumors, without absolutely circumscribing these departments by definite lines at the present time. When that is done, then the profession will cease to occupy the principal part of the time in its meeting or

associations with quarrelling with quacks. Then the public will come to know the usefulness of the profession.

The dental profession, at the present time, is not consulted in one case in a hundred, or one in a thousand of those which require the care of a dentist. That is because the medical profession is not educated to the proper standard, and does not tell these people as they ought to do, that in cases of difficulties about the teeth, they should apply to a good dentist.

The same is true in regard to Surgery. There are operations enough that ought to be performed, in every populous county in the State of Illinois, and which are not performed, to give employment to all the surgeons in those counties. They do not know that there is any man who applies himself to that particular kind of disease, and when they look around for information they look to that particular kind of advertisements in the newspapers; and you know what kind of information they get there. I repeat, then, that the way of progress in the medical profession is in the way of special studies.

How is this to be brought about? I would not have you to suppose, by any means, that there should be a special school for every department of medicine and surgery. On the contrary, I would very much prefer that there should be no divisions whatever. And if I might be permitted to express an opinion upon a subject which may be delicate, it would be an opinion with regard to the dental profession, that they had better not be separated from the medical profession. I think it would be better for them to receive their education in the same schools and to the same extent as other members of the profession. And I think that in order to effect their education there ought to be and will be, perhaps not in my day, but there will be professorships of diseases of the teeth in every respectable medical school in Christendom. What is taught at the present time in most medical schools in regard to teeth, is the order and time of dentition; and then, in case the child is sick during that period, that the gums are to be lanced. In some schools there is a little advance upon that. But there is no medical school, so far as I have any knowledge, where the diseases of the teeth and the causes which produce them, the means of obviating them, the irregularities of the teeth and the means of correcting them; the best thing to do in case of any particular appearances of the teeth; I am not aware that in any institution, even to

that extent, it is properly taught.

Of course there must be colleges of dental surgery, so long as dental surgery cannot be learned elsewhere. This is a want, and until we supply it, the practice of surgery must be necessarily, more or less imperfect. It is necessary, in my opinion, that the dentist should be an educated physician. It is necessary that he should understand the structure of the body beyond the teeth. And I will mention this curious thing about anatomy and quackery. Anatomy in itself would not seem to teach a man much of a practical nature; but I have never yet seen an accomplished anatomist who was a quack, or a quack who was an anatomist. There is an incompatibility between the pursuit of that sublime science, which makes the two incompatible; and if you will fetch before me any man, whether he be a dentist or otherwise, and he will tell me all that is known in reference to anatomy, I will accept that man as a scientific man, without asking him another question. That is the foundation of all medical science, and therefore you must have that; and you must have, in addition to that, the knowledge of physiology. You must have an especial knowledge of the action of medicines, as they operate upon the human system, not to speak of those other branches of science and accomplishments, outside the profession strictly so-called, which are so necessary to give influence to science, to render man happy, to adorn his life, and make him a gentleman. I would have, in the first place, all the different classes of the medical profession educated in the same schools, to the extent of acquiring this general knowledge of which I have just spoken; and then I would have in each college not only a professor of diseases of the teeth, but I would have a special professor with regard to a certain number of other branches, at present of the diseases of the eye and ear, and of the nature and treatment of deformities of every kind. These branches have all acquired a degree of development which requires them to be treated from separate chairs; and when the student had got sufficiently accomplished in general principles, I would have him adopt that branch which he proposes to follow, and devote his special attention to it; and I would have these new chairs instituted from time to time as the wants of the community seem to require.

Medical science, which two hundred years ago was imperfect, has at the present time acquired a degree of development which

renders it impossible that any one should master it in all its details. No intelligent man devoting his time to it can read all the works connected with it that appear in the English, German and French languages, from one end of the year to the other. It is a physical impossibility. It is a physical labor that he could not endure. How then is he to become acquainted with the details of all the different branches, able to perform every kind of operation, able to prescribe for every kind of disease? In proportion as the science advances, it will become still more extended, and difficult. As each science is perfected, this is the rule. There will be further advances which at the present day it will be unwise, if not impracticable, to define.

I have said that the profession, organized in the manner in which I propose, should be formed of parts not in conflict with each other, but should constitute one harmonious whole. The dentists are capable of exercising a great influence upon society. They are a numerous, enlightened, and I am happy to say, wealthy and influential body of men, and we, with all our prejudices, cannot afford to leave them separate and standing off. The physicians and surgeons are capable of exercising a great influence in favor of the dentists, and they would, if better informed and more enlightened, exercise a greater influence than they do, by directing their patients always to apply to them for advice with reference to every question which might arise as to the teeth. This would be an advantage to the dental profession, and they would get it to a much greater extent if they were a recognized part of the medical profession, as they deserve to be. So with all the other different specialties; and whenever I see a man taking up one of these specialties, and for years together undertaking the labor connected with it, I say, "Go ahead, do what you can in that branch of the profession." I do not regard him as in any degree conflicting with my own or any other branch of the profession; I am happy to see it, and I carry my approval to the extent of recognizing the principle in branches of the profession of which I might have, myself, some little doubt. Such branches as the application of electricity to diseases, about which our information is so imperfect and indefinite. I consider that the application of electricity, by an intelligent man, would probably be of great use, and therefore when a man undertakes that specialty, I think he enters upon a useful work, and one that it

is necessary to make a specialty of before it can be relied upon by the profession generally. It is the same with regard to another class of practitioners—the movement-cure men. That term—"Swedish movement cure"—is an unfortunate name. The method of treatment to which it is applied, did not originate in Sweden, but is founded upon the principles of physiology, justified by experience, incapable of being applied by practitioners who have not the necessary knowledge, and promising, in the future, as it shall be developed, the relief of a large class of diseases which have been, heretofore, and which are, at the present time, to a great extent, beyond the reach of surgical treatment.

These, gentlemen, are the essential outlines of the ideas which I wish to present to you. "A word to the wise is sufficient," and therefore I need not dwell upon them. It has given me great pleasure to know that this Convention was a successful convention, and that it was attended by a large number of men from various and distant parts of the country. You have already received a welcome from your own profession here: that welcome was only the expression of the feelings of the general community with regard to yourselves and every other body which comes here for purposes so useful and honorable as yours, and therefore, from the harmony of your session, I have only to hope that it may be useful, interesting and improving, and if you ever need a place to meet in on another occasion, I would take the opportunity of asking you, on behalf of the medical profession and our citizens, to come back to Chicago.

Author

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Index

Allbutt, Sir Thomas Clifford, 72

Allen, Johnathan Adams, 54, 108, 112, 119, 145

American Medical Association (*See also* National Medical Association), 100-101, 121

Andral, Gabriel, 94

Andrews, Edmond, 109-110, 119, 122

Anesthesia, 69-72

Apprenticeships, 3-6, 77

Army Medical Corps, 117-118, 121

Bailliere, J.B., 138

Bartlett, Elisha, 37

Beck, Theodric Romeyn, 10

Bernard, Claude, 96

Bevan, Thomas, 146-148

Bigelow, Henry, 69, 101

Black Hawk War, 1, 142-143

Blackwell, Emily, 80

Blaney, James van Zandt: early life, 43; editor, 48-50, 54, 73; physician, 43, 48, 62; teaching, 44, 47, 109; research, 69-71.

Boardman, Andrew, 11

Boone, Levi, 85

Bowditch, Henry, 37

Brainard, Daniel: early life, 1-5; editor and writer, 48-50, 72-73, 100-101; education (at Fairfield), 6-11; education (at Jefferson), 11-18; education (postgraduate) 34-38, 89-101; family life, 59, 86, 140-142; founder of Rush, 43-56; mayoral candidate, 110; physician, 23-30, 41, 48, 62-66, 73, 148; professional affiliations, 82-85, 100-101; and rebellion at Rush, 78-79, 105-114; research, 69-72, 101-102, 141; teaching, 43, 65-66, 72, 135-137, 148; travels, 89, 92-93, 135-142; tributes, 150-152; war volunteer, 117-121, 132

Brainard, Evelyn Sleight, 59

Burns, Allan, 15

Byford, William, 109-110

Carpenter, Philo, 24

Caton, J.D., 23, 25

Chicago Eye Hospital, 127

Chicago Medical College (Medical School of Lind College), 110-112, 119-120

Chicago Medical Society, 85, 145

Chicago Sanitary Commission, 121, 127-128. *See also* National Sanitary Commission

Cholera, 143-149

Civil War, 117-132

Clark, Alonzo, 37

Cline, William, 92

College of Physicians and Surgeons of the Western District of the State of New York. *See* Fairfield Medical College

Cook County Hospital, 146-147

Cooper, Sir Astley, 90-92

Coste, Jean Francois, 96

Davis, Nathan Smith: early life, 75-77; editor, 77; eulogist, 107-108, 150-151; physician, reformer 77-79, 85, 89, 109; teaching, 76-79, 106, 110, 145

Davisson, A.W., 44

Delamater, John, 7-10

Dix, Dorothea, 129-130

Drake, Daniel, 2, 48

Dubois, Paul, 95

Dupuytren, Guillaume, 34-35

Dupuytren Museum, 37, 94

Dyer, Charles V., 80

Ecole de Medecine. *See* Paris School of Medicine

Egan, William Bradshaw, 24

Evans, Block, 106

Evans, John: early life, 13, 74; editor, 83; entrepreneur, 106; founder of Indiana State Insane Asylum, 74; founder of Northwestern University, 109; teaching, 73-75, 106; trustee of Rush College, 109

Fairfield Medical College, 6-11, 16-18

Fiorelli, Guiseppe, 141

Finlay, Clement, 118

Fitch, Graham, 47-48, 73

Flint, Austin, 47-48, 53-54, 73

Fluorens, Marie-Jean-Pierre, 99

Ford, Thomas, 45

Fort Dearborn, 23, 142-145

Fort Donelson, 121-125

Franklin Medical School, 43

Freer, Joseph, 109, 112, 142, 148

Geneva (Switzerland), Medical Society of, 141

Geneva Medical College, 11

Gerhard, William W., 28, 37

Gibson, William, 105

Goodhue, Josiah, 24-27, 29, 41, 83, 85-86

Goodrich, Grant, 45

Green, Jacob W., 15, 99

Grimaud, M., 145

Gross, Samuel, 4, 16, 71, 97, 101

Guerin, Camille, 97, 98

Guthrie, Samuel, 69

Hadley, James, 8-10

Hammond, William G., Jr., 119

Harmon, Elijah J., 24

Herkimer County Medical School. *See* Fairfield Medical College

Herrick, William B., 47, 59-61, 83, 85, 106-107

Holmes, Edward, 112-114

Holmes, Oliver W., 37

Hospital de la Charité, 34-37

Hôtel Dieu, 34-37, 94-95, 140

Hunter, John, 89, 92

Hunter museum. *See* Museum of Royal College of Surgeons

Illinois Charitable Eye and Ear Infirmary, 112

Illinois College Medical School, 43

Illinois General Hospital of the Lakes. *See* Rush Medical College, hospitals

Illinois Medical and Surgical Journal, 48-50

Illinois-Michigan Canal, 1, 41, 61

Illinois State Medical Society, 83-85

Ingals, Ephraim, 112

Isham, Ralph, 110

Jackson, James, Jr., 37

Jackson, James, Sr., 15

Jardin des Plantes, 99

Jefferson Medical School, 11-16

Johnson, Hosmer, 89-99, 109-110, 149

Kennicott, Robert, 99

Kimberly, Edmond, 24, 45

Knapp, Moses, 44, 47

Knowles, J., 65, 137

Lake House, 66, 82. *See also* Rush Medical School, hospitals

LaPorte University, Medical Department of, 43, 77

Larrey, Dominique J., Jr., 100

Larrey, Dominique J., Sr., 38

Lawson, Thomas, 118

Lèbert, Hermann, 97

Liebig, Justus von, 69

Lincoln, Abraham, 130

Lind College. *See* Chicago Medical College

Locke, Reverend Charles, 150

Louis, Pierre C.A., 37, 73

Lyman, Henry, 146

McClellan, George, 11, 15, 71

McDowell, James V., 43, 85

McLean, John, 44-48, 59, 74-75, 106-109

McNaughton, James, 8

McVickars, Brock, 149, 152

"Maeonian Circle," 18

Magendie, Francois, 96, 99

Malgaigne, Joseph François, 89, 94

Marguerat, Eugene, 146

Maxwell, Phillip, 23

Meigs, Charles, 35-36

Meeker, Daniel, 43

Mercy Hospital, 80-82, 110. *See also* Rush Medical College, hospitals

Miller, DeLaskie, 112, 149

Missouri College, 43

Moore, John, 45

Morfit, J.C., 99

Mound City Hospital, 127-130

Morton, Samuel G., 37

Morton, William, 69

Mott, Valentine, 35, 71, 101

Museum of Royal College of Surgeons, 89-92. *See also* Hunter, John

National Library of Medicine, 132

National Medical Association, 77, 79, 85. *See also* American Medical Association

National Sanitary Commission (Committee), 118-121, 129. *See also* Chicago Sanitary Commission

Nelaton, Auguste, 95

Newberry, Walter, 45

Ogden, William B., 45, 105

Oneida Institute, 2, 17

Orfila, M.J.B., 34, 94

Panic of 1837, 30, 41

Paré, Ambroise, 153

Paris School of Medicine, 34-37, 94-98

Pattison, Granville Sharp, 14-15

Peck, David S., 80

Pope, Charles, 41-43

Pope, Harold H., 3, 7, 23

Powell, Edwin, 135

Prince, David, 43

Quinlan, Charles Henry, 69

Rea, Robert L., 112-121

Redman, James, 3

Reform in medical education:
admission, 79;
apprenticeship, 77;
curriculum, 78; duration of school term, 78;
discrimination, 79-80;
licensure, 78; tuition, 79

Revere, John, 15

Richards, George, 43

Rock River Medical Society, 83

Roux, Philippe, 35, 95

Rush, Benjamin 3-4, 44

Rush Medical College:
building, 45-47; charter, 30; dedication, 54-56;
dispensary, 62-66; faculty, 43-45, 73-77; financing, 45-47; founding, 44, 56;
hospitals, 65-66, 80-82;
journal, 48-50; rebellion, 109-114; students, 52-56, 135-137; trustees, 45, 119

Rutter, David, 110

Saint Louis Medical College, 43

Scott, General Winfield, 143

Shattuck, George C., 37

Skinner, Mark, 45, 119, 121

Smith, Henry, 105

Smith, Nathan, 6

Soubeiran, Eugene, 69, 94

Spalding, Lyman, 6-8

Stearns, John, 10

Stewart, Ferdinand C., 37

Stille, Alfred, 15, 37

Surgeon General's Library. *See* National Library of Medicine

Swift, Joseph K., 4

Sykes, R.S., 3, 7, 18

Temple, John, 24

Trousseau, Armand, 38, 94, 138-140

University of Pennsylvania Medical School, 11-14, 43, 77, 105

Van der Velde, Bishop, 82

Van Osdel, John M., 47, 54

Velpeau, Alfred, 35-38, 95, 140

Warren, John Collins, 69, 71, 101

Western Hospital, 11

Willoughby, Westel, 7-10